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CONTENTS.

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GOULSTONIAN LECTURES on a Contribution to the Localisation of Cerebral Function, based on the Clinico-Pathological Study of Mental Disease. Delivered before the Royal College of Physicians of London on March 1st, 3rd, and 8th, 1910, by JOSEPH SHAW BOLTON, M.D.Lond., F.R.C.P.Lond., Fellow of University College, London; Senior Assistant Medical Officer, Lancaster County Asylum, Rainhill, &c. Lecture III.—(*Illustrated*) ... 1047

HUNTERIAN LECTURES (Abstract of the) on the Surgery of the Lymphatic System. Delivered at the Royal College of Surgeons of England on Feb. 23rd and 25th, 1910, by W. SAMPSON HANDLEY, M.S. Lond., F.R.C.S. Eng., Hunterian Professor, Royal College of Surgeons of England; Assistant Surgeon to the Middlesex Hospital.—Lecture II.—(*Illustrated*) ... 1052

ORIGINAL ARTICLES.

Lumbar Puncture in Meningitis and Allied Conditions: a Clinical Study in Children. By G. STIRLING LANDON, M.D.Edin., late House Physician, Royal Infirmary, Edinburgh, and the Queen's Hospital for Children, London.—(*Illustrated*) ... 1056

Two Notes on Sterilisation of the Skin by the Use of an Alcoholic Solution of Iodine. By HERBERT F. WATERHOUSE, M.D., C.M. Edin., F.R.C.S.Eng., Surgeon and Lecturer on Surgery, Charing Cross Hospital; Senior Surgeon, Victoria Hospital for Children; Member of the Court of Examiners, Royal College of Surgeons; Examiner in Surgery, University of London; and W. STEPHEN FENWICK, M.S., M.B., B.Sc. Lond., F.R.C.S. Eng., Surgical Registrar, Charing Cross Hospital ... 1063

A Case of Embolism of the Abdominal Aorta with Mitral Stenosis, and Thrombosis of the Pulmonary Veins; Death; Necropsy. By SIDNEY P. PHILLIPS, M.D. Lond., F.R.C.P.Lond., Senior Physician to St. Mary's Hospital and the London Fever Hospital ... 1065

A Case of Bile-producing Primary Malignant Tumour of the Liver ("Malignant Adenoma"). With Remarks on the Cells of Malignant Tumours retaining some of the Metabolic or other Functional Characteristics of the Cell Type from which they are derived. By F. PARKES WEBER, M.D. Cantab., F.R.C.P., Physician to the German Hospital, London.—(*Illustrated*) ... 1066

A Case of Epidemic Cerebro-spinal Meningitis, Treated by Flexner and Jobling's Serum; Recovery. By JOHN J. WEAVER, M.R.C.S.Eng., D. P. H. Cantab., Medical Officer of Health, Southport. With Notes by N. PERCY MARSH, M.B. Lond., Physician to the Liverpool Infirmary for Children ... 1068

The Occurrence of a Peculiar Protein in the Urine. By JOHN HENDERSON, M.D., Ch.B.Glasg., Assistant Physician, Royal Infirmary, Glasgow ... 1069

MEDICAL SOCIETIES.

ROYAL SOCIETY OF MEDICINE:

CLINICAL SECTION:—Endothelioma of the Tongue.—Exhibition of Cases ... 1070

LARYNGOLOGICAL SECTION:—Exhibition of Cases and Specimens ... 1071

MEDICAL SOCIETY OF LONDON: Exhibition of Cases ... 1071

MANCHESTER MEDICAL SOCIETY: The Surgery of the Faucial Tonsils.—The Serum Diagnosis of Syphilis.—Chronic Cruro-genital Eczema ... 1072

REVIEWS AND NOTICES OF BOOKS.

Accidental Injuries to Workmen with Reference to Workmen's Compensation Act, 1906. By H. Norman Barnett, F.R.C.S.Edin. ... 1072

The Human Species, considered from the Standpoints of Comparative Anatomy, Physiology, Pathology, and Bacteriology. By Ludwig Hopf.. 1073

Gonorrhœa in Women. By Palmer Findley, M.D. ... 1073

Exercise in Education and Medicine. By R. T. McKenzie, B.A., M.D. ... 1074

A Practical Guide to the Administration of Anæsthetics. By R. J. Probyn-Williams, M.D.Durh. Second Edition 1074

Text-book of Nervous Diseases and Psychiatry. By Charles Dana, M.D., LL.D. Seventh Edition ... 1074

Obstetrics for Nurses. By Joseph B. De Lee, A.M., M.D. Third Edition ... 1075

International Sport. By Theodore Andrea Cook ... 1075

Archives of Internal Medicine. Vol. V., No. 2 ... 1075

The Burlington Magazine ... 1075

LEADING ARTICLES.

THE DEBATE ON THE PREVENTION OF DESTITUTION BILL... 1076

THE LOCALISATION OF CEREBRAL FUNCTION: THE GOULSTONIAN LECTURES ... 1077

DEATHS UNDER ANÆSTHETICS.. 1078

ANNOTATIONS.

Rag-flock ... 1079

Dr. John Rutter and the Liverpool Medical Institution ... 1080

Cerebro-spinal Meningitis in Belgium ... 1080

Rabelais the Physician ... 1081

Duration of the Infectivity of the Glossina Palpalis ... 1081

Duelling in Italy ... 1082

Society of Medical Officers of Health: a Presidential Election ... 1082

Recurrent Intracranial Pseudo-Tumour ... 1082

Occupation Mortalities ... 1083

Comparative Strengths of some Commercial Solutions of Epinephrin ... 1083

The International Committee for Post-Graduate Courses... 1084

The Arthritic Diathesis ... 1084

The Work of the Pellagra Investigation Committee ... 1084

Successful Resection of the Intestine for Mesenteric Thrombosis ... 1085

Regional and Myoclonic Convulsions ... 1085

Lumbar Puncture in Meningitis ... 1085

The Occurrence of Adventitious Sounds in the Normal Chest ... 1086

The Treatment of Dry Arthritis by Injection of Vaseline ... 1086

PUBLIC HEALTH.

Annual Reports of Medical Officers of Health ... 1093

VITAL STATISTICS:

Health of English Towns ... 1093

Health of Scotch Towns ... 1094

Health of Irish Towns ... 1094

Vital Statistics of London during March, 1910 ... 1094

Analysis of Sickness and Mortality Statistics in London during March, 1910 ... 1095

SPECIAL ARTICLES.

Report of Inquiry into the Question of Deaths Resulting from the Administration of Anæsthetics ... 1087

Annual Report of the Medical Officer of the Local Government Board.—II. ... 1089

The Bureau of the Permanent Commission of the International Congresses of Medicine: Meeting at The Hague 1091

Medicine and the Law ... 1092

The Services ... 1096

A Medical Survey in the Philippines ... 1099

Birmingham ... 1100

Manchester ... 1100

Scotland ... 1101

Ireland ... 1102

Paris ... 1102

Budapest ... 1103

Canada ... 1103

Notes from India ... 1104

New Zealand ... 1104

CORRESPONDENCE.

The Climate of Hong-Kong, with Account of Journey from there to London (Dr. J. M. Atkinson) ... 1097

The Occurrence of Adventitious Sounds in the Normal Chest (Dr. R. D. Rudolf) ... 1098

Simultaneous Fracture of the Patellæ (Mr. A. E. Johnson).. 1098

The Supply of Antitetanus Serum in London (Messrs. Parke, Davis, and Co.) ... 1098

Difficult Points in Life Insurance ... 1099

Soldiers' Teeth and Officers ... 1099

The New Examination Hall of the Royal Colleges of Physicians of London and Surgeons of England ... 1111

LOOKING BACK.
(From THE LANCET, Saturday, April 14th, 1832.)

The Cholera in Paris ... 1092

OBITUARY.

Frederic Victor Milward, M.B., B.C.Cantab., F.R.C.S.Eng., L.R.C.P.Lond. ... 1105

Deaths of Eminent Foreign Medical Men ... 1106

MEDICAL NEWS.

St. Pancras Tuberculosis Exhibition ... 1055

Chelsea Hospital for Women... 1064

Municipal Technical College, Brighton ... 1067

Metropolitan Public Gardens Association ... 1067

The late Dr. George Carpenter 1072

Donations and Bequests ... 1086

An Exhibition of Fractures ... 1105

Pass-lists of the Examining Board in England by the Royal Colleges of Physicians of London and Surgeons of England, Royal College of Surgeons of England, University of London, Society of Apothecaries of London, and the London School of Tropical Medicine ... 1106

Foreign University Intelligence ... 1107

The Royal Sanitary Institute.. 1107

The Winsley Sanatorium near Bath ... 1107

The Royal Hospital for Sick Children, Glasgow ... 1107

A Church Lads' Brigade Medical Corps ... 1108

PARLIAMENTARY INTELLIGENCE.

Notes on Current Topics ... 1108

House of Commons: The Milk-Supply in London ... 1108

Appointments ... 1110

Vacancies ... 1110

Births, Marriages, and Deaths 1111

Notes, Short Comments, and Answers to Correspondents.. 1111

Medical Diary ... 1112

Acknowledgments of Communications received ... 1114

FOR INDEX TO ADVERTISEMENTS SEE PAGES 2 & 4.

INDEX

MEDICAL AND OTHER BOOKS AND PUBLICATIONS

COVER

PAGE

ARNOLD:—
Savill ..... Clinical Medicine 1

BAILLIERE, TINDALL & COX:—
Vincent .... Nutrition of the Infant 1

CASSELL & CO.:—
Yarr ..... Military Ophthalmology 1

CHURCHILL, J. & A.:—
Bigg ..... Spinal Curvatures..... 1
Galabin & Blacker .. Practice of Midwifery.. 1

GLAISHER:—
Ash ..... Mind and Health 1
Savill ..... Neurasthenia 1
" ..... Lectures on Hysteria .. 1

LEWIS:—
Binnie ..... Manual of Operative Surgery 1
Roberts .... Theory and Practice of Medicine 1
Thursfield & Branson .. Medical Morbid Anatomy, &c. 1
Tilley ..... Diseases of the Nose, &c. 1

LONGMANS, GREEN & CO.:—
Hare ..... Food Factor in Disease 1

MACMILLAN & CO.:—
Tubby & Jones..... Surgery of Paralyses .. 1

PAGE

MEDICAL PUBLISHING CO.:—
Lane ..... Cleft Palate & Hare Lip 1
" ..... Treatment of Fractures 1

NISBET & CO.:—
Lane ..... Chronic Constipation .. 1

PRESCRIBER OFFICE:—
The Prescriber 1

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Some of Saunders' Important Books for the Practitioner 1

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Bulletin of Novelties 1
Norwood Sanatorium—
Hare: Inebriety 1

ADLARD & SON:—
Wood ..... Spa Treatment 8

BAILLIERE, TINDALL & COX:—
Baker ..... The Spectroscope 3
Bidwell .... Intestinal Surgery..... 3
Crook ..... High Frequency Currents 3
Gardner .... Surgical Anæsthesia.... 3
Green ..... Pathology 3
Heine ..... Operations on the Ear.. 3
Herbert .... Cataract Extraction.... 3
Ince ..... Latin Grammar of Pharmacy 3
Lake ..... Diseases of the Ear..... 3
Lamb ..... Throat, Nose, and Ear.. 3
Monro ..... Manual of Medicine.... 3
Moor & Hewlett .. Applied Bacteriology .. 3

PAGE

BAILLIERE—(Continued).
Muter ..... Analytical Chemistry .. 3
Robertson .. Meat & Food Inspection 3
Sawyer..... Physical Signs..... 3
Sutherland.. Blood-stains..... 3
Tredgold .. Mental Deficiency..... 3
Walsh ..... Rontgen Rays..... 3
Williams.... Minor Maladies 3

CASSELL & CO.:—
Herman .... Diseases of Women 8
Lewis ..... Delicate Children 8
Wickham & Degrais .. Radiumtherapy 6

GRIFFIN & CO.:—
Caird & Cathcart .. Surgical Handbook 8

HODGETTS:—
Public Health Service Directory and Year Book 8

LEWIS:—
Lewers..... Diseases of Women 9
" ..... Cancer of the Uterus .. 9

LONGMANS, GREEN & CO.:—
Dickson .... The Bone Marrow..... 7
Gray ..... Anatomy 7
Halliburton.. Chemical Physiology .. 7
Probyn-Williams.. Guide to Administration of Anæsthetics .. 7
Quain ..... Anatomy 7
Schafer..... Essentials of Histology 7
Williams.... Rhinology..... 7

MACMILLAN & CO.:—
Ballance .... Surgery of the Brain .. 8

PAGE

METHUEN & CO.:—
Cavanagh .. The Care of the Body .. 9
Childe ..... Control of a Scourge .. 9
Clouston .... The Hygiene of Mind .. 9
Drink Problem 9
Gorst, Sir J. E. Children of the Nation 9
Macfie ..... Air and Health 9
Newman .... Infant Mortality 9
Newsholme .. Prevention of Tuberculosis 9
Oliver, Sir T. Diseases of Occupation 9
Salmsbury .. Drugs, &c..... 9
Schofield .... Functional Nerve Diseases 9

SAUNDERS COMPANY:—
Bickham .... Operative Surgery..... 5
Campbell .. Surgical Anatomy..... 5
Friedenwald & Ruhrah.. On Diet 5
Meyer & Schmieden. Bier's Hyperemic Treatment 5

SMITH, ELDER & CO.:—
Lawson .... Diseases of the Eyes 6

SPRAGUE & CO.:—
Ernst..... Orthopædic Apparatus Guide 8

THE LANCET:—
Territorial Medical Service 6

MEDICAL LIBRARIES, &c.:—
Baker—Book Bargains..... 8
Beasley & Ketley—Stammering 8
Behnke—Stammering 8
Hygienic Handbook 8
Matthews Bros—
Wood: Application of Trusses.... 8
Squire's Companion 33

OFFICIAL AND GENERAL ANNOUNCEMENTS

COVER

HEALTH RESORTS, BATHS, &c.:—
Roncegno ii

OFFICIAL NOTICES:—
Royal Society of Medicine..... i

APPOINTMENTS VACANT:—
Beckett Hospital, Barnsley 72
Belgrave Hospital for Children, Clapham-road 69
Boltingbroke Hospital, Wandsworth Common 69
Bristol Royal Hos. for Sick Children 72
Bury Infirmary 71
Central London Throat and Ear Hos. 72
Chelsea Hospital for Women 69
City of London Hospital for Diseases of the Chest 70
Croydon General Hospital 72
Eastern Dispensary, Leman-street, E 79
Elham Union 70
Evelina Hospital for Sick Children .. 72
Hereford County and City Asylum .. 72
Homes for Little Boys, Farningham.. 72
Horton Infirmary, Banbury 70
Hospital for Consumption and Diseases of the Chest 70
Hospital for Sick Children, Great Ormond-street 70
Kent and Canterbury Hospital 71
Lancashire County Asylum, Winwick 71
Leeds General Infirmary..... 69
Leicester Infirmary 70
London Lock Hospital..... 71
Manchester Royal Infirmary, &c. 72
Mount Vernon Hospital for Consumption 71
National Dental Hospital and College 71
Newcastle-on-Tyne Dispensary 71
Nobles Isle of Man General Hospital and Dispensary 71
North Riding Infirmary, Middlesbrough 70
Norfolk and Norwich Hospital 69
Oldham General Infirmary 72
Paddington Green Children's Hospital 69
Parish of Leicester..... 72
Prince of Wales's General Hospital, Tottenham..... 70
Queen Charlotte's Lying-in Hospital 71
Royal Albert Hospital, Devonport .. 71
Royal Berkshire Hospital 70
Royal College of Surgeons of England 71
Royal Free Hospital, Gray's Inn-road 79
Royal Infirmary Hull..... 71
Royal London Ophthalmic Hospital.. 70
Royal Naval Medical Service 69
Rutland County Council 70
St. Bartholomew's Hospital 70
Sheffield Royal Hospital 69
Southwark Union Infirmary..... 72
Transvaal Government Laboratories 70
Tunbridge Wells General Hospital .. 70
University College of South Wales and Monmouthshire 71
Western Skin Hospital 72
West Herts Hospital, Hemel Hempstead 69
Wolverhampton and Staffordshire General Hospital 71
York Dispensary..... 72
Zenana Bible and Medical Mission.... 69

ASSISTANCIES MEDICAL 78

ASYLUMS, HOMES, &c.:—
Applegarth Sanatorium, Northallerton 68
Ashbrook Hall, St. Leonards on-Sea.. 60
Ashwood House, Kingswinford 61
Barnsley Hall, Bromsgrove 62
Barnwood House Hospital 62
Bishopstone House, Bedford 61
Buntingford House Retreat, Buntingford 64
Camberwell House, Peckham-road.... 61
Cheadle Royal 61
Clarence Lodge, Clapham-park..... 61
Coppice, The, Nottingham 64
Court Hall, Kenton 62
Crooksbury Sanatorium, Surrey 65
Dalrymple House, Rickmansworth .. 68
Dartmoor Sanatorium 65
David Lewis Colony, Alderley Edge .. 63
Earlswood Asylum, Redhill 63
Ghyll Retreat, Cockermouth 63
Grove House, Church Stretton 62
Grove, The, Catton, Norwich 62
Gwydor Nursing Home 69
Hadyn Brown, Cate ham Valley..... 69
Hasiemere Nursing Home 69
Haydock Lodge, Newton-le-Willows.. 65
Heigham Hall, Norwich 61
Home for Epileptics, Maghull 60
Home Sanatorium, West Southbourne 64
Hon. Sec., Chancery-lane 69
Invermith Lodge Retreat, Colinsburgh 64
Kingsdown House, Box 61
Lady Superintendent, Streatham 61
Laund House, Nelson 69
London Fever Hospital, Islington 69
London Open-Air Sanatorium, Wokingham 64
Mailing Place, Kent 62
Melbourne House, Leicester 68
Middelburg Sanatorium, Transvaal .. 67
Middleton Hall, Co. Durham..... 61
Moat House, Tamworth 62
New English Sanatorium, Leysin 67
Newlands House, Tooting 61
Newmains Retreat, Lancashire 64
Nordrach-on-Dee, Banchory 65
Nordrach-upon-Mendip Sanatorium .. 65
Northlands Retreat, Wandsworth 68
Northwoods House, Winterbourne.... 63
Norwood Sanatorium 63
No. 453, L.O., Strand..... 69
No. 459, L.O., Strand..... 69
No. 578, L.O., Strand..... 69
Osea Island, Heybridge 68
Otto House, West Kensington 61
Peckham House, Peckham-road 65
Plympton House, South Devon 62
Portsmouth Corporation Mental Hos. 62
Roberts, Golder's Green 69
St. Andrew's Hospital, Northampton 62
St. Luke's Hospital, E.C. 61
Sanatorium Clavadel 68
Shaftesbury House, Formby-by-the-Sea 63
Springfield House Private Asylum, Bedford 62
Stocker, Craven-street 69
Stretton House, Church Stretton..... 62
The Grange, Rotherham 61
The Retreat, Witham 69
The Retreat, York 61
Tower House, Leicester 68
Vale of Clwyd Sanatorium..... 65

ASYLUMS—(Continued).
Warneford Asylum, Oxford 61
Whitmead Hill Sanatorium, Farnham 64
Wonford House, Exeter 62
Wye House, Buxton 62
Yarrow Convalescent Home, Broadstairs 64

COMPANIONS:—
No 420, L.O., Strand..... 79
Sedgwick, Carlisle 79

FINANCIAL, &c.:—
Birkbeck Bank..... 59
Equitable Reversionary Interest Soc. 59

HEALTH RESORTS, BATHS, &c.:—
Aberystwyth, the Biarritz of Wales .. 80
Badgastein 68
Bad Wildungen 66
Campbell, Manchester-square 69
Cornish Riviera 68
Engelberg, Switzerland 67
Leysin, Switzerland 67
Peebles Hotel Hydropathic 68
Roncegno 17
Royal Ems, Germany 67
Smedley's, Matlock 68
Wiesbaden 66
Woodhall Spa Bromo Iodine Baths .. 65

HOTELS:—
White Hart Hotel, Margate 68

HOUSE & ESTATE AGENTS:—
Bruton, Knowles & Co., Gloucester .. 77
Freeman, Mill Hill 77
Howell, Son & Bonnin, Cromwell-road 77
J. G., Ilford 77
Ley Clark, Wimpole-street 75
No. 354, L.O., Strand..... 76
No. 445, L.O., Strand..... 77
36, Charlotte-street, W. 77
CONSULTING-ROOMS:—
Clark & Son, New Cavendish-street.. 77
No. 446, L.O., Strand..... 77
No. 457, L.O., Strand..... 77

LIFE & FIRE ASSURANCES:—
Prudential 59
Royal Exchange Assurance 59

MASSAGE:—
H. M. S., Regent's-park 59
J. P. P., New Cross 69

MEDICAL ACCOUNTANTS, &c.:—
Turner 78

MEDICAL AGENTS:—
Blundell & Rigby 76
Fieldhall, Limited 76
Manchester Medical Agency 77
Manchester Medical Association 72
Medical Agency 76
Moore & Co. 72
Needes, Herbert 77
Needes, J. C. 75
Peacock & Hadley 75
Reynolds & Branson 75
Scholastic, Clerical, &c., Assoc. 74
Turner 73

MEDICAL SCHOOLS:—
(LONDON.)
Charing Cross Hos. Medical College.. 54
Guy's Hospital Medical School 56
London Hospital Medical College 55
London (Royal Free Hospital) School of Medicine for Women 54
London School of Tropical Medicine.. 54
St Bartholomew's Hos. and College .. 54
St. Mary's Hospital Medical School .. 55
West London Post-Graduate College 56
(PROVINCIAL, &c.)
Anderson's College Medical School, Glasgow 53
University of Aberdeen 57
University of Birmingham..... 57

NURSING INSTITUTES:—
General Nursing Association..... 59
Hospital for Sick Children, Great Ormond-street 59
Leeds Trained Nurses' Institution .. 59
London Nurses' Association 60
Male Nurses' Association 59
Male Nurses' Co-operation 60
Maternity Nursing Association 59
Mental Nurses' Co-operation..... 59
Metropolitan Temperance Association 60
National Hos. Male Nurses' Assoc.... 59
Nurses' Co-operation, Portland-place 59
St. John's House 59
St. Luke's Hospital, E.C. 59
Temperance Male and Female Nurses' Co-operation 60
Temperance Male Nurses' Co-operation 60

OFFICIAL NOTICES:—
Brompton Hospital for Consumption 58
City of London Lying-in Hospital.... 56
King's College 56
London Hospital Medical College 55, 56
London Post-Graduate Association .. 56
London School of Clinical Medicine .. 56
Medical Graduates' College, &c. .. 54, 56
Oxford University 58
Queen Charlotte's Lying-in Hospital.. 56
Royal College of Physicians of London..... 58
Royal Institute of Public Health 55
Royal London Ophthalmic Hospital.. 56
Throat Hospital, Golden-square 54
University of Cambridge..... 58
University of London 56
York-road General Lying-in Hospital, Lambeth..... 56

PARTNERSHIPS & PRACTICES 77

RAILWAY & STEAMSHIP CO.'S:—
New Zealand Shipping Co..... 59
R.M.S.P.—Tours 59
" Special Yachting Cruises .. 59

SCHOOLS, PREPARATORY, &c.:—
Wellington Court Preparatory 58

TUTORS & LECTURERS:—
Beckton 58
Carlyon College 58
Fellowship 53
Gemmell 53
Knight 58
No 115, L.O. .. 79
No. 125, L.O. .. 58
Patterson 58
Schnelle 53
Weymouth 55

(For Index to Trade and Miscellaneous Advertisements see page 4.)

The Goulstonian Lectures

ON

A CONTRIBUTION TO THE LOCALISATION OF CEREBRAL FUNCTION, BASED ON THE CLINICO-PATHOLOGICAL STUDY OF MENTAL DISEASE.

Delivered before the Royal College of Physicians of London on March 1st, 3rd, and 8th, 1910,

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LECTURE III.[1]

Delivered on March 8th.

MR. PRESIDENT AND GENTLEMEN,—Having completed the description of my observations and deductions with regard to the structure and functions of the visuo-sensory (or sample sensory projection), the visuo-psychic (or sample special associative), and the prefrontal (or higher voluntary associative) regions of the cortex, I now pass on to certain observations with regard to the structure and functions of the final type of cortex with which I propose to deal—namely, the pre-Rolandic or psychomotor.

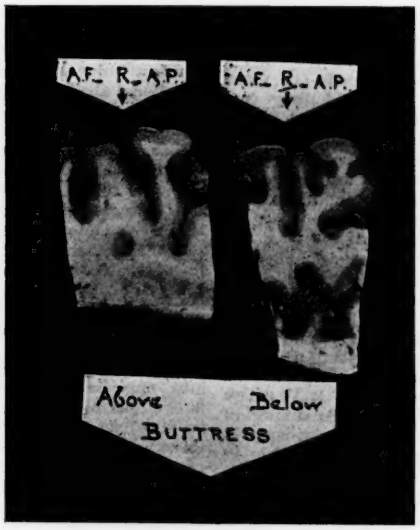
STRUCTURE AND FUNCTIONS OF THE PRE-ROLANDIC CORTEX.

It is unnecessary for my purpose to describe in detail the great controversy which raged for so many years as to whether this region possessed purely motor or sensori-motor functions. I shall merely remind you of how the histological researches of Bevan Lewis and Henry Clarke, which as long ago as 1878 resulted in the delineation of the Betz cell area, were forgotten in the heat of the controversy until 1901, when, through the experimental work of Sherrington and Grünbaum, followed by the histological researches of Campbell and of Brodmann, they finally received belated recognition.

Since that time the majority of observers have credited the precentral gyrus with motor and the postcentral with sensory functions; and this opinion received confirmation, so far at any rate as the experimental method can be regarded as capable of affording it, from the researches of Oskar Vogt, who in 1906 published a paper describing the results of stimulation and extirpation of the precentral and postcentral gyri. In brief, Vogt concluded that palsy without ataxy followed destruction of the precentral gyrus, and ataxy, but no palsy, resulted from destruction of the postcentral gyrus. Last year, however, in the Linacre lecture, Sir Victor Horsley described what he regards as a crucial test case and reiterated his conviction that the so-called motor area is really sensori-motor. From this patient, who suffered from athetoid movements of the left hand followed by violent convulsive movements of the whole upper limb, Horsley removed by operation the portion of pre-Rolandic cortex which, as the result of stimulation, he concluded to constitute the whole of the arm area. He carefully describes the immediate results, which were partly motor and partly sensory, and the remote results (a year later), which consisted of permanent absence of spasmodic movements, partial recovery of voluntary movement of the left upper limb, and considerable recovery from the sensory disability. On this case Horsley bases his contention that the precentral gyrus is sensori-motor in function.

The evidence which I purpose laying before you points to very different conclusions regarding the functions of this region of the cortex, and, unless these conclusions are correct, the whole of the observations and deductions contained in my two previous lectures falls to the ground. I would, therefore, submit that in my opinion the experimental method, even in the hands of so renowned an operator as Horsley, cannot be regarded as trustworthy. On purely theoretical grounds, it might well be doubted whether a gyrus of considerable size could be removed without any disturbance of the functions of the immediately adjacent gyrus resulting, but in this instance anatomical reasons exist which appear to me to render such an operation a practical impossibility. To indicate these I will now show on the screen naked-eye sections through the fissure of Rolando which are situated above and below the buttress, and thus indicate the arrangement of the neighbouring gyri in both these positions. I introduce the two sections in order to avoid the possible criticism that the arm area is not included, since this area was placed above the buttress as the result of the earlier stimulation experiments on man, although it is now considered to lie below this annectant. In the first section, which is above the buttress, is seen the extremely narrow neck of the gyrus postcentralis, and the nearness of this to the site of operation. In the next section, which is below the buttress, the same point is equally clearly visible, as is also the relative nearness of the gyri of the parietal operculum to the seat of operation. Apart entirely from the intimate structural and functional associations of the pre- and post-central gyri, these photographs in my opinion indicate the probability, I may even say the certainty, that removal of the precentral gyrus, however carefully performed, will result in functional if not also in actual structural interference with the fibres passing to and from the postcentral gyrus.

FIG. 19.



Naked eye sections across the central convolutions. The left hand section is above the buttress, and the right hand section is below this annectant. R. = furrow of Rolando. A.F. = precentral or ascending frontal gyrus. A.P. = postcentral or ascending parietal gyrus. Both sections show the extremely narrow neck of the postcentral gyrus, and the right hand one also indicates the proximity of the gyri of the parietal operculum. The figure demonstrates that removal by operation of the precentral gyrus, however, skilfully performed, must necessarily result in functional, and probably also in structural, damage to the fibres entering the neck of the postcentral gyrus.

LAMINATION OF THE PRECENTRAL GYRUS.

I now pass on to the consideration of the structure of the precentral gyrus, from the aspect of cell lamination. In the case of this region I have not resorted to the micrometric method, partly because the structural conditions preclude the possibility of obtaining a series of measurements from the four situations I am accustomed to select, and partly because the practical absence of a middle cell lamina or granule layer renders measurement of this untrustworthy even if possible. I therefore propose to illustrate my point, not by series of measurements from human subjects, but by exhibiting certain mammalian cortices, which show the depths of the various laminæ in a cruder but equally satisfactory manner. As a preliminary remark, I would state that the lamination of the precentral gyrus, though to the inexperienced eye indefinite, is of the usual general type, consisting of an outer fibre or superficial lamina, an outer cell

[1] Lectures I. and II. were published in THE LANCET of April 2nd (p. 905) and 9th (p. 980), 1910.

or pyramidal lamina, a middle cell or granule lamina, an inner fibre lamina or inner line of Baillarger, which here contains the Betz cells, and an inner cell or polymorphic lamina.

The photographs are all of the same magnification and strictly comparable. Fig. 20 is taken from the Betz cell region of the dog. The laminæ of which it is composed are the superficial (I.), the pyramidal (II.), the indefinite granule (III.), the inner line of Baillarger with certain Betz cells (IV.), and the polymorphic lamina (V.). I wish particularly to draw your attention to the fact that the second lamina or pyramidal layer (0·45 millimetre) is in depth about one-third of the combined depths of the laminæ below it (1·18 millimetres). I would also point out the large size and generally embryonic condition of the cells in all the laminæ.

Fig. 21 illustrates the precentral cortex of the rhesus. The laminæ of which it is composed are the outer fibre (I.), the pyramidal (II.), the thin granule (III.), the inner line of Baillarger with certain Betz cells (IV.), and the polymorphic lamina (V). I would particularly ask you to note that the depth of the pyramidal lamina (0·91 millimetre) is practically equal to the conjoined depths of the laminæ below it (0·90 millimetre), and also that the individual cells of all the laminæ are smaller and more numerous than in the dog, and are also better made and relatively more widely separated from one another.

Fig. 22 shows the cortex of the human precentral gyrus. The laminæ of which it is composed are the outer fibre lamina (I.), the second or pyramidal lamina (II.), the very indefinite granule lamina (III.), the fourth lamina or inner line of Baillarger with certain Betz cells (IV.), and the fifth or polymorphic lamina (V.). I would draw your attention to the fact that the second or pyramidal lamina (1·24 millimetres) is in depth four-thirds of the conjoined depths of the laminæ below it (0·92 millimetre), and also to the detail that the individual cells are very well made and are more widely separated from one another than in the rhesus. A comparison of Figs. 20 to 22 shows that the essential differences between the cortices consist in a very marked and progressive improvement in the development of the individual cells in all the laminæ, but, particularly, in the degree of evolution of L.II, the pyramidal lamina, of the several cases. L.II, the outer cell or pyramidal lamina, which is of psychic, associative, and educative significance, is thus the prominent feature of the precentral cortex of man. L.III, the granule or receptive lamina, is reduced to a minimal depth in all the cortices. L.IV & V, which are of organic and instinctive significance, are similar in type in man and the rhesus, and in the dog their depth is somewhat greater and their cells are more embryonic in structure.

CONCLUSIONS FROM STUDY OF LAMINATION.

A study of these cortices leads to the following conclusions. The outer cell lamina or pyramidal layer of the dog is one-half of the depth of that of the rhesus, which again is three-fourths of that of the human subject. The middle cell lamina is so deficient in depth and in content as to be practically invisible, except to the experienced observer. The combined depth of the lower laminæ is practically the same in the rhesus and man, and is one-fourth deeper in the dog than in the others. The ratio of the depth of the second or pyramidal lamina to that of the three lower laminæ is in the dog about one-third, in the rhesus 1/1, and in man 4/3. In man, therefore, the precentral ratio is as high as, or slightly higher than, in the prefrontal region, in which the general average measurements give an average ratio of about 11/10.

As a very rough analogy, the pyramidal lamina of the dog may be compared with that of a still-born infant, and the pyramidal lamina of the rhesus with that of an imbecile.

Finally, in passing from the dog to the rhesus and from the rhesus to man there is a very marked and progressive improvement in the development of the individual cells in all the laminæ, which general improvement, however, pales before the great difference which exists in the three cortices with regard to the evolution both in depth and in content of the outer cell or pyramidal lamina.

In view of the conclusions which I expressed in the last lecture with regard to the functions of the primary cell laminæ of the cortex the deduction is evident. The outer cell or pyramidal lamina, which is of psychic, associative, and educative significance, is the prominent feature of the precentral cortex of man. The granule or receptive lamina is reduced to a minimum depth in all the cortices. The fourth and fifth laminæ, which are of organic and instinctive significance, are of the same depth and general type in man and in the rhesus, and in the dog their conjoined depth is one-fourth greater and their individual cells are more embryonic in structure. *The obvious conclusion, therefore, is that in man the psychic, associative, and educative functions of the precentral gyrus are paramount, that in all three the receptive functions are minimal or non-existent, and that the organic and instinctive activities are approximately on the same level in all the three.* When this conclusion is regarded in association with the well-known truth that the particular type of cortex under consideration increases in area and differentiation, during the ascent of the mammalian scale, not according to muscular bulk, but according to the degree of motor educability exhibited by the several parts of the body, the further conclusion that the Betz cells merely serve as a relatively simple motor mechanism, and that motor educability must have its structural seat in the second or pyramidal lamina, is inevitable. That the Betz cells serve as the origin of the pyramidal tracts has long been believed. It is, in fact, many years now since I noted well-developed Betz cells in the cortex of a fœtus of six months, and therefore took for granted that they served as the origin of these tracts. The truth of this presumption has recently been finally proved by Holmes and Page May. Further, it has long been known to physiologists that whilst the pyramidal tracts normally conduct voluntary efferent impulses, such impulses in the functional absence of these tracts can still find passage. For example, a hemisection of the spinal cord of a dog followed by a higher hemisection on the opposite side, and this again followed by a still higher hemisection, this time on the original side, results in at least a very considerable return of power over both lower limbs. It may thus be regarded as proved that the Betz cells serve, not as the psychomotor cortical mechanism, but simply as a subservient mechanism for the direct transmission of voluntary impulses to the lower motor centres. I may add, as a necessary consequence to this conclusion, that the Betz cell distribution need no longer therefore be regarded as indicative of the limits of the cortical zone concerned with the evolution of those associational processes which, when translated by the agency of the lower motor centres into muscular movements, constitute the sole objective indications of cerebral activity. If, as I consider proved, reliance can be placed on the results of the histological investigations of the past decade, the educable psychomotor cortex, with little modification, extends over almost or quite the posterior half of the frontal lobe, where it grades, through cortex of an intermediate type, into that of the prefrontal region.

Having, as I hope, sufficiently indicated my reasons for regarding the precentral cortical zone as psychomotor, rather than motor or sensori-motor, in function, I will exhibit, as a histological contrast, a slide prepared from an illustration published by Gordon Holmes, in order to show the well-defined middle cell lamina or granule layer which exists in the postcentral gyrus. The proportion which the depth of this lamina bears to the total depth of the cortex—namely, about one-eighth—is to me, at any rate, sufficient in itself almost to prove that this cortex belongs to a sensory projection sphere; in other words, to indicate with great probability the performance of sensory receptive functions by the postcentral gyrus.

LOCALISATION OF CEREBRAL FUNCTION.

The general trend of the results of the recent histological survey of the cerebral cortex, which followed the enunciation by Flechsig of his doctrine of centres of projection and centres of association, and which has culminated in the elaborately detailed descriptions of Brodmann, has, to say the least, been highly suggestive of the existence of a definite correlation between histological structure and functional significance; and it is probable that the histological method, without entirely replacing the experimental, will in the future be still more fruitful in this direction. In the personal investigations which I have described I have endeavoured, by the employment of subnormal and pathological

FIG. 20.

FIG. 21.

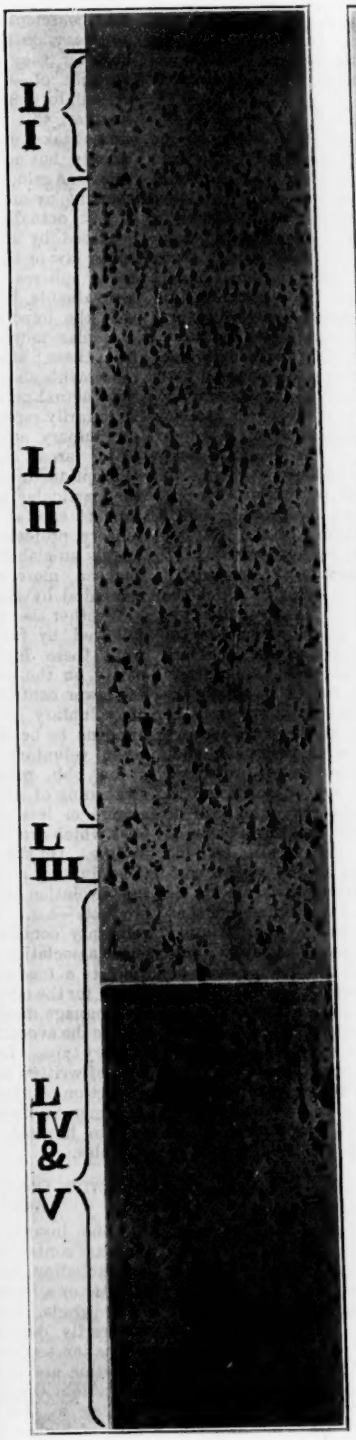


FIG. 22.

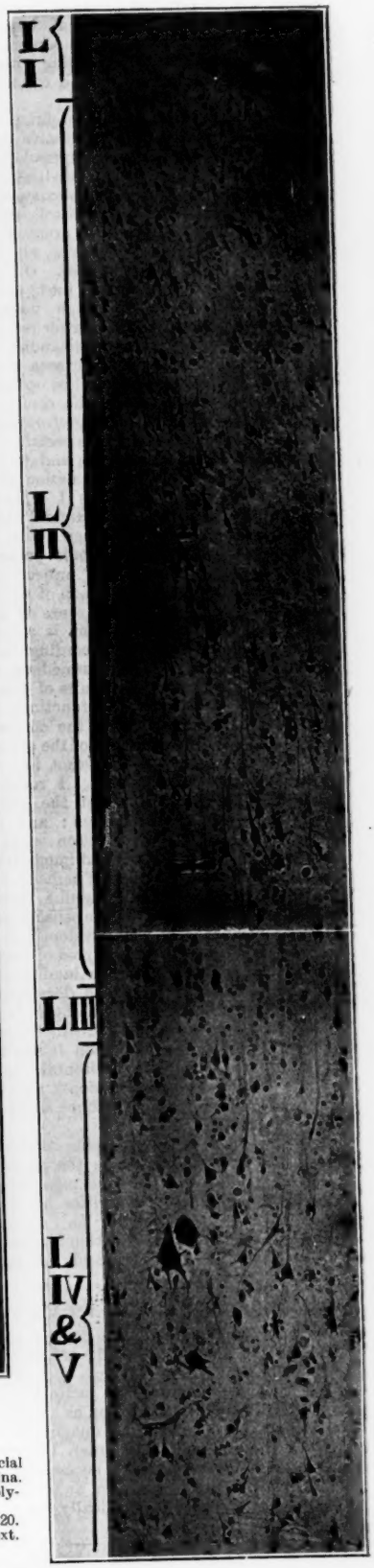


FIG. 20.—Cortex of the Betz-cell area of the DOG. 109 diameters. L.I = outer fibre or superficial lamina. L.II = outer cell or pyramidal lamina. L.III = the indistinct middle cell or granule lamina. L.IV & V = the inner fibre lamina or inner line of Baillarger containing Betz cells, and the polymorphic lamina. The depth of L.II is about one-third of the conjoined depths of L.III–V.

FIG. 21.—Cortex of the Betz-cell area of the RHESUS. 109 diameters. L.I to L.V as in Fig. 20.

FIG. 22.—Cortex of the Betz-cell area of MAN. 109 diameters. The full description is in the text.

material, to obtain proof of the functional significance of certain of the histologically differentiated regions of the cortex. Such proof as I have obtained leads me to adopt, as a partially proved provisional hypothesis, the following scheme of the localisation of cerebral function. I do not claim originality, since in dealing with cerebral function one needs to select rather than to enunciate opinions owing to the multitude of these.

I would regard the human cerebrum not as a sensori-motor but as an intermediate or associative ganglion, which on the one hand receives sensorial impressions and elaborates them by processes of association into the physical equivalents of psychic products of high complexity, and which on the other hand to a variable extent controls, selects, and coördinates certain of these equivalents, eventually transforming them into further physical complexes whose function is to set in action the lower motor centres. On this functional basis I would divide the cerebrum into pre- and post-Rolandic portions, the former of which possesses controlling and executive functions, and the latter receptive and elaboratory. I would subdivide the pre-Rolandic part, or frontal lobe, into a posterior or psychomotor area which is concerned with the evolution of such physical complexes as are necessary to give external expression to the results of cerebral association, and into an anterior or prefrontal area which is able to control, select, and coördinate certain of the results of post-Rolandic cerebral association, and to either allow these to undergo psychomotor transformation or to inhibit this process. Both these functions I regard as proved, and I consider the outer cell or pyramidal lamina of the cortex to be at least the chief seat of their actual performance.

The cortex of the post-Rolandic portion of the cerebrum I would regard as consisting of projection areas, of which the visuo-sensory area is a type, each of which is surrounded by, or possesses in its proximity, zones of special association, of which the visuo-psychic region is a type, which zones are hall-marked in function according to their appropriate projection areas; and of intermediate cortex in which are fused and elaborated the results of the special processes of association. I consider the functions of the visuo-sensory and visuo-psychic regions of the cortex to be proved, and, from homology, the functions of the other areas of projection and special association, the exact location of which is still probable rather than certain. I regard the outer cell or pyramidal lamina as at least the chief physical basis of these processes of association; and the middle cell or granule lamina of the projection areas as the region concerned with the reception and immediate transformation of sensorial impressions. I may perhaps here remind you that the middle cell or granule lamina attains to its maximum degree of development in the sensory projection areas, and that it continues to be well developed in the special zones of association. In both these types of cortex there is no clear line of demarcation from the laminæ above and below it. The granule lamina is of good development in the posterior region of general association, and also in the prefrontal area, in which latter it is more distinctly separated from the laminæ above and below it than in any region with which I am familiar. From the prefrontal region backwards the granule lamina decreases in depth and distinctness until in the psychomotor area it reaches a minimal depth and is barely discernible.

The inner cell or polymorphic lamina, as I have already stated, has been shown to be the prominent lamina in the lower mammalia, and must be regarded as subserving such organic and instinctive activities as are not acquired by education. It is probable, for reasons which I have indicated, that this is its function in man.

[The nature of language and the language mechanism were then briefly dealt with.]

LANGUAGE AND ITS MECHANISM.

By these few remarks I have endeavoured to indicate and illustrate the fact that words are merely symbols which possess different grades of value, and which are meaningless unless they are employed to incite the occurrence of such processes of cerebral association as are necessary to awaken the various sensori-memorial images of which such words are but the symbols. In order, therefore, that language may possess meaning, there necessarily occurs, during the employment of its mechanism, an active associational participation on the part of practically the whole mantle of the cerebrum.

As a preliminary to the consideration of the manner in which the language mechanism is voluntarily employed, I would remark that words, in my opinion, invariably arise into consciousness through the activity of sensory spheres, and may do so through that of any one of these. When, however, they are voluntarily and silently reproduced—i.e., thought of—words are invariably awakened through the articulatory-motor word centre under normal conditions. Further, this reproduction requires a muscular effort, and cannot take place without a definite attempt at articulation, usually, but not necessarily, accompanied by a slight expiration. Again, words cannot be voluntarily repeated in thought by means of the cheirographic centre if the hand is not actually moved, unless such hand movements are replaced by slight movements of the head, or even of the lower jaw or the eyes, through the agency of their respective motor spheres. Such observations as I have just indicated are valuable, because they render it probable, if not certain, that the important factors in the reproduction are not the muscular movements, but the sensorial impulses derived from these; otherwise there is no reason why such muscular movements should not be imagined, without any attempt at their actual performance. I thus consider that words, when voluntarily reproduced, are invariably awakened through the preliminary action of the prefrontal region on the psychomotor area, activity of which results in stimulation of appropriate neuron-complexes subserving the evocation of the particular sensori-memorial images which arise in the zone of special association attached at one or more of the sensory projection spheres. This view, I may remark, is merely an elaboration of that long ago advanced by Hughlings Jackson, more recently supported by Stricker, and strongly combated by Bastian.

Whether the arousing of such sensori-memorial images is followed by further processes of cerebral association, and what these further processes are if they occur, depend partly on the general condition, as regards excitability, of the lower centres of association and partly on such degree of voluntary guidance and control of these processes as happens to be exercised. For example, in dreamy states, when voluntary selection, coördination, and control are at a low ebb, processes of lower association, involving the awakening of all kinds of sensori-memorial images, occur in a more or less riotous manner according to certain general laws which are well known and need not be further referred to here. On the other hand, as an extreme example, during the voluntary employment of written or spoken language for the evolution and reproduction of the highest psychic products—e.g., the production of an abstruse thesis—voluntary control over, and guidance of, the processes of lower association are paramount. In such a case, however, there is a tendency, which requires to be continually combated, for the cerebral processes to keep to the general lines of the language mechanism, to the exclusion of such processes as involve the evocation of visual sensori-memorial images of the ordinary type. In other words, during the voluntary employment of written or spoken language for the evolution and reproduction of abstract thought, there is a tendency for the performer to become unintelligible to others, and perhaps even to himself, unless he continually reverts to concrete examples.

DEFECTIVE CONTROL OF PROCESSES OF LOWER CEREBRAL ASSOCIATION IN MENTAL DISEASE.

In the insane, as I shall now illustrate by examples, voluntary control over the processes of lower cerebral association, including the activity of the language mechanism, is to a greater or a lesser extent defective. In amentia, according to its grade, such voluntary control is permanently or temporarily defective. In many of the lowest types the mammalian tendency to sleep, unless the processes of lower association are stimulated by sensorial or organic stimuli, is observable. On the other hand, in attacks of simple mania occurring in the higher grades of amentia, the prefrontal centre of higher control is in functional abeyance, and the cerebrum acts as an uncontrolled sensori-psychomotor machine. Instead of, as normally happens, but a small selected number of the ever-entering stream of afferent impressions being noticed, almost every visual and auditory stimulus which arrives at the cortex is accepted. Processes of cerebral association incited by these occur pell-mell and find motor expression in emotional disturbance, rapid movements, and a riotous display of words. It is impossible to obtain

more than the momentary attention of the sufferer. This condition of uncontrolled sensori-psychomotor activity may last for hours, days, or weeks, after which the patient becomes, at any rate for the time, sane.

Again, in dementia, according to its grade, voluntary control over the cerebral processes of lower association is permanently defective or absent. If this be defective and the centres of lower association be normal, the chief clinical features exhibited by the patient are a general hebetude and a lack of interest in his surroundings. If, however, aberrant states of the centres of lower association exist, certain additional symptoms, to which I shall refer later, are presented. Further, in the grosser grades of simple dementia no evidence whatever of the existence of cerebral activity may be exhibited or obtainable, and the patient is an inanimate object, unable even to feed himself or to attend to the calls of nature.

I will mention as a final example the numerous cases of premature dementia which exhibit strange motor phenomena, and which are commonly classed under the term "catatonia." I believe that these phenomena are due to the occurrence of a more or less extensive dissolution of the neurons of the psychomotor areas in certain subjects, usually juvenile, in whom the fundamental psychomotor neuron groupings are still imperfectly organised into relatively stable complexes. The pathological condition is thus, on the one hand, one of subevolution of function, and on the other, one of dissolution or involution, the tract of cortex involved being practically the whole frontal lobe.

Such motor phenomena resemble, in brief, those which would occur in a "Frankenstein-man" or "mechanical-model," in which certain parts were imperfectly fashioned; in which certain groupings of parts were imperfectly tested and not in proper running order; in which the higher mechanical complexes were imperfectly controlled and co-ordinated into series, and therefore tended to stop, to repeat action, or to go by fits and starts; and in which, owing largely to the existence of several sources of motive power (i.e., from the different organs of sensation), certain mechanical complexes tended to run independently in consequence of an imperfect general coördination of, and control over, the whole mechanism. The motor phenomena are thus varied, and are, on the whole, of a distinctly positive or a definitely negative nature; and repetition, wayward and grotesque action, &c., are common.

In chronic cases the phenomena are often still further complicated as regards an immediate explanation, but simplified as regards their actual exhibition, by a more or less extensive dissolution of neurons, which results in stereotyped motor remainders of former skilled accomplishments. These, occurring on the dissolution side of the scale, differ in character from the erratic, grotesque, repeated, mechanical-model-like, and often unskilled movements which occur on the subevolution side and are due to imperfect control and insufficient practice.

That this explanation is probably correct is indicated by the fact that in a series of chronic cases of premature dementia without motor phenomena 55 per cent. exhibited a moderate grade of dementia, whereas, in a series presenting motor phenomena, as many as 73 per cent. had attained a moderate grade of dementia. I may remark that this grade of dementia indicates the existence of intracranial morbid appearances of moderate intensity, these representing the usual final stage which cerebral dissolution reaches in the absence of marked degeneration of the cerebral arteries.

INDEPENDENT ACTIVITY OF LOWER CENTRES OF ASSOCIATION.

I now pass to the consideration of certain phenomena due to the independent activity of the lower centres of association. Words, as I have remarked, when voluntarily reproduced in thought, are awakened through the action of the prefrontal cortex on the psychomotor area, this commonly being followed by activity of one or more centres of special lower association, and often by that of the whole region of general lower association. Such are, therefore, regarded as normal products of thought of *personal* origin. The other normal, and in this case non-personal, mode of origin, which applies to all types of sensation, is, of course, that of sensorial stimulation.

A third mode of origin of words, and also of other varieties of sensori-memorial image, is, however, common in normal persons; and if the mode is not more common the results of it are, at any rate, more obtrusive in the subjects of mental disease. I refer to the spontaneous arising of words or other sensori-memorial images in the auditory or visual centres of lower association. From my experience of these phenomena in the subjects of mental disease I have no hesitation in classing all such as hallucinations, which hallucinations may or may not be distinguished by the subject from true auditory or visual sensations. A homologous phenomenon to such a hallucination may be observed during the stimulation of the psychomotor area of a monkey which has recovered from anæsthesia. Such an animal regards the movement, say of the arm, with great surprise and at once performs a voluntary and opposite movement, exactly as if the limb had been moved by an external agency. The resemblance between this response and the behaviour of a lunatic who is replying to "voices" is striking.

[These remarks were then illustrated by reference to "dreamy states" and dreams, and the subject of illusion in the sane was discussed. Illusion and hallucination in the insane were then dealt with, and were illustrated by reference to certain types of mental disease, from the aspects of high grade amentia on the one hand, and of recoverable mental confusion and the mental confusion of actively progressive cerebral dissolution on the other.]

ILLUSION AND HALLUCINATION.

It is thus evident that illusion and hallucination grade from, on the one hand, the simple false recognitions of the normal sane individual to, on the other, vivid associated memories which arise by processes of lower association in the absence of sensorial stimuli, and which, in the absence of control over these processes of cerebral association, may present such a resemblance to the psychic results of the recognition of sensorial stimuli as to be mistaken for these and projected externally. Normal illusions thus occupy one end of the series, and the purely psychic phenomena described as hallucinations occupy the other, the numerous intermediate types of illusion possessing greater associational and less sensorial components until pure hallucinatory phenomena are reached.

Such psychic phenomena may occur as the result of a pathological process which is of a temporary nature or which will result in neuronic dissolution; they frequently, however, occur in the absence of active pathological conditions of the cortical neurons. In the former case, particularly when the pathological process is widespread, considerable mental confusion exists, and illusions may occur in association with aberrant sensorial stimuli of any kind. It is usual, however, for visual illusions to predominate, because, in such patients, visual stimuli are as a rule the more numerous. In the latter case, in the absence of active pathological states of the cortical neurons, and in the consequent absence of mental confusion, the psychic phenomena as a rule occur at night, and are often precipitated by imperfect and aberrant auditory stimuli. The cause of this relative prominence of auditory psychic phenomena appears to be twofold. On the one hand, in at any rate most ordinary individuals, the usual channels for the reception and transmission of knowledge are hearing and speech, sight, except in the case of special psychic acquisitions, occupying a subordinate position. Further, the majority of persons think in words as spoken rather than in words as seen. On the other hand, at night, and particularly during sleep, the higher cerebral processes are dormant or at their lowest ebb, and in consequence the processes of lower association, if active, are uncontrolled. Again, fear or apprehensiveness is naturally greater at night, or in the dark, than it is by day; and hearing, which is then the only sense available, is therefore preternaturally acute. It is thus possible to give a simple psychological explanation of the prominence of auditory illusions and hallucinations in such types of case as high-grade amentia and non-progressive dementia.

It is, of course, impossible in this lecture to do more than refer in the briefest manner to those more common symptoms of mental disease the physical bases of which may be relegated without hesitation to the centres of lower association. I shall therefore make no reference to the subject of delusion in the sane and the insane, or to that interesting and allied question the recording of experience in a time-related manner. I have merely endeavoured, as far as the time at my disposal has permitted, to indicate, in more or less

general terms, the relationship which I think exists between the normal processes of lower cerebral association and those which occur in the insane. Whilst the linking together of such normal and abnormal processes of cerebral association cannot be regarded as evidence in favour of the particular partially proved provisional hypothesis of the cerebral functions which I have attempted to lay before you, such a comparison is nevertheless of interest in that it shows that the processes of cerebral association, whether of the sane or of the insane, are equally susceptible of explanation by means of it.

In conclusion, I would thank you for the patience with which you have listened to what must appear to you a most unsatisfactory and incomplete description of observations which are in themselves equally unsatisfactory and incomplete. Though I dare not hope that I have even partially convinced you of the truth of the conclusions at which I have arrived, I at least trust that I have been successful in my efforts to show that the specialty of psychiatry is as worthy of study as are other and more honoured branches of medicine.

Note.—I have already made full acknowledgments elsewhere of the permission I have received during the past 15 years to use the cases and material needed during my investigations. It is, however, necessary to add that I continue to obtain my new material, through the courtesy of Dr. J. Wiglesworth, at the Rainhill Asylum. I would here repeat my grateful thanks to Dr. G. A. Watson, the pathologist, and to Mr. F. J. Abram, the photographer, for their ever ready assistance.

ABSTRACT OF THE

Hunterian Lectures

ON

THE SURGERY OF THE LYMPHATIC SYSTEM.

Delivered at the Royal College of Surgeons of England on Feb. 23rd and 25th, 1910,

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LECTURE II.[1]

Delivered on Feb. 25th.

MR. PRESIDENT, LADIES, AND GENTLEMEN,—The next of the local lymphatic œdemas which claims our attention is elephantiasis arabum. This affection sometimes, though very rarely, originates in temperate climes. But, if inclined to minimise its importance, we should obey the exhortation to think imperially, and remind ourselves that in parts of India, according to Sir Patrick Manson, one individual in 20 suffers from the disease, while in some of the South Pacific islands half the population are affected.

My own experience of elephantiasis is a small one, mainly restricted to cases originating in this country. It is therefore with some hesitation that I approach the subject and venture to criticise some of the conclusions of such a master of research as Sir Patrick Manson. In justification of my criticisms and suggestions I may, however, plead Sir Patrick Manson's own statement that the pathology of elephantiasis is still obscure. The following quotation from his work presents a general picture of the disease in its clinical aspect:—

> Elephantiasis begins with an attack of lymphangitis and erysipelatoid inflammation of the integuments. Constitutional symptoms are severe, setting in with a sharp and prolonged rigor, followed by high fever, which in the course of a day or two generally ends in profuse diaphoresis, and often in a sort of lymphous weeping from the implicated skin. The inflammatory effusion is only partially absorbed, and some thickening remains. These attacks occur at irregular intervals of weeks or months, each attack leaving the limb or scrotum rather larger than before, until, in the course of years, the skin and cellular tissue has become enormously and permanently hypertrophied, and an unwieldy mass, justifying its name—elephant leg—is formed.

The success of lymphangioplasty in cases of dropsical arm naturally excited my hopes of equal success in elephantiasis, and an opportunity of trying the method occurred in a case which was fully described in THE LANCET of Jan. 2nd, 1909. This case, which differed clinically in no respect from tropical elephantiasis, save in the absence of micro-filariæ from the blood, raised the question whether the filarial theory of tropical elephantiasis is the whole truth. It proved, so far as one case can prove anything in a world of fallacies, that chronic infection with the staphylococcus alone, in the absence of filariæ, may cause elephantiasis.

The occurrence of micrococci in tropical elephantiasis, or more strictly speaking in the attacks of tropical lymphangitis, which precede or accompany elephantiasis, has attracted the attention of certain French observers. Just after the detection of the micrococci in the foregoing case I made the acquaintance of the work of Dufougeré, who describes an organism which he calls the lymphococcus, as constantly present in tropical lymphangitis. Dufougeré believes that in the absence of the filaria tropical lymphangitis subsides without leading to elephantiasis. Nor, in his opinion, does filarial infection alone produce elephantiasis, but if an individual in whose blood micro-filariæ are circulating becomes infected also with the lymphococcus through some wound or abrasion, the filariæ are killed and their dead bodies accumulate in the lymphatic glands and vessels, producing the obstruction which leads to elephantiasis. Dufougeré found the lymphococcus in three cases of acute lymphangitis, in two of which elephantiasis was already present.

Mr. A. G. R. Foulerton and Miss H. K. Whittingham state that "in the short description given of the lymphococcus there is nothing by which the organism could be distinguished from the staphylococcus."

In the year 1907 le Dantec described a diplococcus, which he called the dermococcus, as present in the subcutaneous tissues in elephantiasis in association with streptococci in the circulating blood. He believes that elephantiasis depends on the simultaneous presence of both organisms. Foulerton and Whittingham believe that these organisms are also in reality the *Staphylococcus albus*.

Can these results be ascribed to accidental contamination with skin organisms? Such a view is negatived, at any rate in my own case, by the opsonic observations, by the effects of vaccine treatment in preventing further attacks of lymphangitis, and by the fact that the cocci were observed in stained films of lymph taken from deep punctures. In my own opinion there is a good *primâ-facie* case for the belief that micrococci, derived originally from the skin, play an important part in the causation of elephantiasis. At any rate, further investigation is desirable, and it may be hoped that an expedition for the study of elephantiasis will add yet further laurels to the London School of Tropical Medicine.

My experience in the foregoing case showed that lymphangioplasty is not a cure for elephantiasis. It still seemed possible, however, that the operation might establish for itself a definite position in the treatment of patients who have sufficient leisure and intelligence to carry out prolonged after-treatment. But even this hope seems doomed to be disappointed, for in a second case of elephantiasis upon which I recently operated, though great temporary benefit resulted, within a few months of the operation the swelling of the leg has recurred, although the limb remains considerably softer than before operation. This patient carried out the after-treatment most carefully at home, and the recurrence of the swelling in her case shows to my mind that lymphangioplasty has failed to establish its position in the treatment of elephantiasis of the leg.

It would appear that in the lower extremity as contrasted for instance with the arm, the strenuous opposition of gravity nullifies the effects of the operation as soon as the limb is allowed to hang down for even a short period daily. The operation does, indeed, supply the channels which are missing, but, as I have always insisted, it does not provide a motive force. It is unable to fight against the full vertical pressure of gravity in the lower limb.

There is, however, another and more hopeful way in which the therapeutic problem of elephantiasis might be attacked, and that is by way of prevention or of arrest in an early stage. As I have shown there is a body of evidence that micrococci play an important and perhaps an essential part in its causation. And I would suggest, with the modesty

[1] Lecture I. was published in THE LANCET of April 9th, p. 977.

becoming my lack of tropical experience, and yet with the emphasis of strong belief, that elephantiasis can be arrested in its early stages by vaccine treatment directed against the micrococci which are present in many, if not all, cases of recurrent tropical lymphangitis—the forerunner of elephantiasis. In support of this belief I can quote my own case, the first case of elephantiasis, as far as I know, in which vaccine treatment has been employed. In this case no further febrile attacks have occurred since the vaccine treatment—a fact upon which the patient himself commented. If it proves to be possible to prepare a *Staphylococcus albus* vaccine which is a reliable safeguard against elephantiasis, the benefit to some tropical communities will be incalculable.

OTHER FORMS OF LYMPHATIC ŒDEMA.

My unfavourable conclusions with regard to lymphangioplasty in elephantiasis probably apply to all lymphatic œdemas of the lower limb, and I am thus absolved from dealing with them in detail. Nevertheless, they may be briefly referred to.

Under the heading of solid œdema dating from early life may be grouped a collection of probably heterogeneous cases in which there is a more or less solid œdema of one or both feet, extending a variable distance up the limb, tending, if uncontrolled, to become progressively worse, unaccompanied by visceral disease and not due to any traceable infection. The condition may be congenital, or may begin in infancy or childhood. In certain cases of this group the disease is hereditary, and has been given the name of Milroy's disease. Family histories of this type have been placed on record not only by Milroy but by Dr. H. D. Rolleston, Dr. Hope and Dr. H. S. French, Dr. G. A. Sutherland, and Dr. W. Bulloch. The disease is generally held to be caused by vaso-motor disturbance and to be closely related to angioneurotic œdema. One of Dr. Sutherland's patients had suffered from purpura and urticaria.

Cases may be met with which differ from Milroy's disease only in the absence of the hereditary element. Two such cases have been submitted to lymphangioplasty, one by Dr. T. P. zum Busch and one by myself, in both cases without benefit.

Cellulitis following a septic wound is sometimes followed by persistent brawny œdema, presumably due to associated lymphangitis and subsequent lymphatic obstruction. It is very doubtful whether such cases are suitable for lymphangioplasty, for phlebitis and venous obstruction are usually also present.

Although until recently I hoped that lymphangioplasty would be of benefit in puerperal white leg, I had always felt that the almost invariable presence of an element of venous obstruction made the question a very doubtful one. And although several such cases have been referred to me for the operation I have not found among them one which I considered favourable for the first essay. At the present time, and in view of the failure of the operation for elephantiasis of the leg, I am of opinion that lymphangioplasty is not applicable in such cases.

From a pathological point of view it is interesting to note that long-standing œdema from chronic tubal nephritis may produce in the legs many of the changes characteristic of elephantiasis, as in the following case:—

> The patient, a man aged 22 years, was admitted under my care with a view to the possibility of lymphangioplasty. When 9 years of age swelling of the ankles commenced and has progressively increased. The legs and feet are now much swollen, but the œdema still pits slightly on pressure. Two years ago the hands began to swell. The face also swells if his head is lowered, and the lumbar region as he lies in bed. Elevation of the part affected soon reduces the œdema. The urine contains 4·5 per cent. of albumin. The skin of the swollen legs shows the characteristic changes of elephantiasis, especially on the feet. Between the toes the skin is in a remarkable condition, being uniformly covered with somewhat pointed papillary eminences like an exceedingly coarse velvet.

My senior colleague, Dr. J. J. Pringle, sent to me last year a case which appears to show that tertiary syphilis may cause lymphatic œdema and all the changes characteristic of elephantiasis. The photograph which I show you absolves me from a detailed description of the case. The presence of foul gummatous ulcers upon the thickened skin deterred me from attempting operation, and present experience shows that it would have been useless.

THE OPERATIVE TREATMENT OF ASCITES.

I now come to the second main division of my subject—the application of conservative surgery to the treatment of ascites. The pioneer in this field of surgery is Mr. Rutherford Morison, who designed and carried out an operation for establishing in cases of portal obstruction a collateral circulation by way of the great omentum, which is artificially implanted in the subcutaneous abdominal tissues. While in some cases this operation has been strikingly successful, such cases form a small minority of the number in which the method has been applied. Thus Greenough, quoted by Jacobson and Rowlands, collected 105 cases of the operation, with a mortality of 29·5 per cent., and only 9 showed improvement after two years. The methods of internal drainage I am about to describe are certainly much safer than the Talma-Morison operation, and present experience indicates that they are much more efficient.

The treatment of ascites by the continuous drainage of the ascitic fluid into the tissues is a suggestion of my senior colleague, Dr. W. Essex Wynter, whose paper on this subject in the sixteenth volume of the *Archives of the Middlesex Hospital* is undoubtedly one of classical rank. It was my privilege to carry Dr. Wynter's scheme into successful practice, and subsequently to develop the same idea in association with the principles of capillary drainage by means of silk. I can best introduce the subject in Dr. Wynter's own words. He says:—

> The treatment of ascites by repeated paracentesis, commonly employed in hepatic cirrhosis, has proved unsatisfactory, inasmuch as in the majority of cases the fluid returns within a few days, and the patient is confined to bed or hospital for the remaining brief period of life, which seldom extends beyond two or three months.
>
> The steady downhill course and rapid loss of strength after paracentesis has been inaugurated indicate that the patient pays dearly for the relief of distension by the sacrifice of so much nutrient fluid, whose speedy replacement drains the blood and tissues and starves the kidneys.
>
> The objects aimed at by the method of subcutaneous drainage are:—1. The saving of nutrient material to the patient. 2. To ensure an adequate outflow of urine from the kidneys and a sufficient supply of fluid to the tissues by draining the stagnant pond of the peritoneal cavity. 3. To enable the patient to leave his bed and to maintain the circulation of the body fluids, especially in the portal and lymphatic systems, by means of exercise. 4. To relieve intra-abdominal tension, and thus promote lymphatic absorption and the establishment of a good collateral circulation.

To these objects I may add: 5. To diminish the intra-abdominal pressure by slow and gradual stages, thus avoiding the increased transudation of blood fluid and the possible hæmorrhage which may result from a sudden drop in the intra-abdominal pressure, such as occurs in the ordinary operation of tapping. Dr. Wynter adds that in view of the impaired vital resistance and deficient powers of repair found in ascitic patients a long operation, or one attended by much shock, is not to be thought of.

FEMORAL DRAINAGE.

Dr. Wynter considered the femoral canal as the best spot to choose for making the peritoneal opening, owing to its accessibility and low situation, the fluid being then allowed to flow into the subcutaneous tissues of the thigh, whence it is absorbed by the lymphatic vessels of the part. This operation may be spoken of as femoral drainage. The first case upon which it was performed was transferred to me for the purpose from Dr. Wynter's ward. This patient remains absolutely well up to the present date (January, 1910), a period of 2½ years.

TECHNIQUE OF THE OPERATION OF FEMORAL DRAINAGE.

The only difficulty in femoral drainage is that of finding the femoral canal. The tense abdomen bulges downwards over Scarpa's triangle, and the canal itself appears to be drawn up under Poupart's ligament by the tension of the peritoneal fluid, and perhaps by contraction of the peritoneum from chronic inflammation. I have found the following to be the best method. The special instruments required are a large-sized curved trocar and cannula, and a long blunt-pointed seeker, curved so as to pass through the cannula. Messrs. Mayer and Meltzer have made these instruments to my design. Tap the peritoneal cavity in the middle line about 2 inches above the pubes. Withdraw the trocar and insert the long seeker through the cannula, which it fits fairly closely. Next by a flap incision with its convexity directed outwards expose the region of the femoral ring. With the aid of the seeker find the situation of the femoral ring and push the seeker into it, thus making the femoral canal bulge into the floor of the femoral wound. With two pairs of artery forceps seize the peritoneum of the femoral canal on either side the point of the seeker, and with a pair of scissors

freely divide the peritoneum between the forceps. A certain amount of ascitic fluid escapes, but care should be taken not to empty the abdomen. Now introduce two sutures, one on either side of the opening, each taking up the peritoneum, and passing through Poupart's ligament. The sutures when tied serve to secure the patency of the new opening. Finally, suture the skin incision.

Among 5 cases of femoral drainage for ascites which have been operated upon at the Middlesex Hospital by my colleagues and myself 1 case must be excluded as due to carcinoma. Two of the remaining 4 cases were cured, while in the other 2 cases the course of the disease was unaffected, or influenced, if at all, in a favourable direction. These results in the case of a disease which is almost uniformly fatal are striking enough. It is probable that, whatever method of drainage be employed, there will be a not inconsiderable percentage of failure, for in some cases the ascitic fluid seems to be poured out in a cataract with which no drainage channels can be expected to cope. Thus in one of the cases 784 ounces of fluid collected within three days of paracentesis, a quantity which would appear beyond the carrying capacity of the absorptive vessels.

Effective as the operation of femoral drainage has proved itself, it has certain obvious defects. The new opening is

Trocar and cannula, with long curved seeker, for the operation of femoral drainage.

liable to be accidentally blocked by the descent into it of a piece of omentum, or by the adhesion of a loop of intestine over it. It may be closed within a short time by the natural processes of repair.

It occurred to Dr. Wynter that by the insertion in the linea alba of a flanged silver eyelet, with an opening a quarter of an inch in diameter, the peritoneal cavity might be placed in permanent communication with the subcutaneous tissues, at the cost of an operation hardly more severe than that of paracentesis. The skin is sutured over the eyelet, which now remains permanently in position. But this method proved unsatisfactory and the problem remained as before. It appeared to me that the question of providing a permanent outlet for the ascitic fluid might be solved by a modification of the operation of lymphangioplasty. Since the principle of the method was well tried and successful in the case of lymphatic œdema, I had no reason to doubt that the silk threads would act in the manner desired. The only doubt was whether they would form sufficiently capacious conduits to deal with such large quantities of fluid as are thrown out in ascites. In regard to the manner of their introduction, I have not been able to decide what is the best method. Many technical variations are possible, and the operation may not be standardised for some years to come.

In one case in which I decided to attempt internal drainage by means of silk threads the abdomen was opened by an incision in the left semilunar line and a large quantity of ascitic fluid escaped. The peritoneum generally was much congested, more especially the omentum, which oozed persistently when handled. Several ligatures had to be applied to check this bleeding. A stout needle threaded double with lymphangioplasty silk was now passed in and out in a series of loops through the peritoneum and subperitoneal tissues of the left iliac fossa external to the mesocolon. Short loops of the silk were left exposed within the peritoneal cavity, whence they could suck up fluid by capillary attraction. The process was repeated with two other threads. The four threads were conducted in the manner described to a point close to the anterior superior spine. With the aid of a long probe they were then thrust beneath the outer end of Poupart's ligament some way downwards into the subcutaneous tissues of the thigh. The abdominal wound was now closed in such a way that the sutures used provided additional permanent channels for the escape of fluid from the peritoneal cavity. A number of thick silk ligatures were employed, taking up the peritoneum and the muscular layers of the abdomen, but leaving out the skin. These were tied and the skin was then closed over them with a continuous superficial suture. At first the operation appeared to be a failure. The fluid re-collected and tapping became necessary 18 days after the operation, when 7½ pints were withdrawn. Two days subsequently the patient was discharged at her own request. She was icteric and grey looking, and appeared to have but a short time to live. I felt that if she could manage to get up and about gravity would assist the abdominal drainage, but even so I had abandoned hope of a favourable result. Her abdomen on discharge was 35¾ inches in circumference, and though not tense it contained a large amount of fluid, which appeared to be increasing rapidly. It was therefore a pleasant surprise when on July 28th she again presented herself looking much better. The abdomen though full was flaccid, and its circumference had decreased by more than 3 inches. Surrounding the region of the scar there was an œdematous area measuring about 8 by 4 inches, a clear proof that the silk used to suture the wound was acting in the way desired. On the other hand, so far from being œdematous, the thigh and leg were slightly smaller in circumference on the left than on the right side. It seemed as if the silk threads led into the thigh had proved useless. About Nov. 1st, 1909, a crop of subcutaneous gummata appeared on the left leg below the knee. About the same time the left leg began to swell. On Jan. 8th, 1910, when I again saw the patient, the left leg was markedly œdematous, measuring more than an inch more in circumference than the right one, and presenting numerous gummata, one of them ulcerated. The right leg was very slightly œdematous. The abdominal œdema had disappeared. The abdomen itself measured round the umbilicus 35½ inches, almost exactly the same as on her discharge eight months previously, but 3 inches more than on July 28th. It was so flaccid that no definite thrill could be obtained, though evidently a considerable amount of fluid was present. The liver could be definitely felt below the costal margin, although after the first tapping in the hospital it had been noted as atrophic. Her colour was good and her conjunctivæ clear and white, her tongue moist and clean, although she had not absolutely given up alcohol. She was free from abdominal pain and tenderness. She was getting about and living an ordinary life, although previously she seemed at death's door.

It is interesting to note that until seven months after the operation no proof was forthcoming of the functional efficiency of the silk threads led into the thigh. Œdema of the leg only appeared simultaneously with a local crop of gummata. It seems reasonable to infer, first, that without causing œdema drainage into the thigh had gone on ever since the operation; secondly, that if the absorptive power of the tissues is normal, and if the amount of fluid led into them is not excessive, the appearance of œdema is not to be expected; thirdly, that local lymph stasis favours the onset of gummata in the affected part; and fourthly, that the gummata in their turn interfere in some way with the return of lymph.

There are several points in which this case is open to criticism. It may, in the first place, be said that the case is one of syphilitic, not of alcoholic, ascites, and specific ascites is known to be amenable to specific remedies. But although the syphilitic element is undoubted, the alcoholic one is equally certain; and, so far as I know, no antisyphilitic remedies had been given until Jan. 10th, 1910, nine months after the operation. In view of these facts, and of the œdema of the region of the abdominal wound and of the left leg which were observed at different times, it can hardly be denied that the silk drainage operation determined her recovery.

The threads inserted in this case appear to be active and capacious channels while the patient is in the erect position and while the abdominal pressure is high. Under these conditions they appear capable of removing nearly half a pint of

fluid per diem. In bed, or after abdominal pressure has fallen to somewhere near the normal, their action seems to be sluggish. Thus they have failed to remove the considerable amount of fluid which may be present in the peritoneal cavity without distending it.

CANCER SURGERY AS A BRANCH OF LYMPHATIC SURGERY.

The whole field of the surgery of carcinoma belongs, in the strictest and most literal sense, to the ablational department of lymphatic surgery. When, for instance, an operation is performed for breast cancer, its object is not the extirpation of an organ but, as I have expressed it elsewhere, "the removal intact of the permeated area of the lymphatic system which surrounds the primary growth." This permeated area often extends far beyond the limits of the breast. At its periphery the lymphatic vessels are plugged by cancer cells, while the tissue spaces around are entirely free from cancerous infection. The removal of the infected area demands an accurate knowledge of lymphatic anatomy, and of the mode in which cancer spreads along the lymphatic vessels. To call such an operation "an amputation of the breast" is a dangerous abuse of words which is responsible for many failures in this field of surgery, a field apparently easy to traverse but in reality full of concealed pitfalls. Cancer surgery, then, is essentially a study in the extirpation of a diseased lymphatic area. Such a statement may appear to rest on too narrow a basis of evidence, for the theory of lymphatic permeation which I brought forward in 1904 has only been proved in the case of cancer of the breast and of melanotic sarcoma.

Some years ago I made repeated attempts to demonstrate permeation in the neighbourhood of abdominal cancers, using methods which I have found effective in the case of mammary cancer. These attempts, and similar ones made by at least two other investigators, ended in failure, owing to the difficulty of distinguishing cancerous from normal cells under the microscope.

Owing to the tendency of abdominal cancers to undergo mucoid degeneration it is very difficult to identify the degenerate cells with certainty when they occur separately or in small groups. But if mucicarmine, a specific stain for mucin, is used to stain the sections, the presence in tissues from which epithelium is normally absent of cells or débris stained red affords conclusive proof of cancerous invasion. In such tissues mucicarmine is a specific stain for cancer cells; not indeed, for healthy and active ones, but for those which are already dying or dead. Two years ago, from this chair, I was able to bring forward strong, if not conclusive, evidence, obtained by the mucicarmine method, that cancer of the stomach is disseminated by permeation. Some recent work which I have done on rectal cancer demonstrates the working of the same process, and affords a new and convincing illustration of the truth of the permeation theory and of my contention that cancer surgery belongs to the ablational department of lymphatic surgery.

In a recent case of rectal carcinoma in which I removed the growth by a successful combined abdominal and perineal operation I was able to demonstrate a mode of spread of the disease hitherto undetected. A longitudinal strip along the whole length of the excised bowel, measuring 10 inches, was submitted to microscopic examination by the hæmatoxylin-mucicarmine method. Conclusive evidence was obtained that the growth had spread by permeation along the mucous lymphatic plexus of the bowel at least as far as the point of section of the bowel 6 inches above the growth. How much further it had spread upwards I am, of course, unable to say. A similar spread downwards was traced as far as the region of the sphincters. In the plane of tissue between the blind ends of the Lieberkühnian follicles and the underlying muscularis mucosæ, at short intervals, cancer cells, isolated or in small groups, or small masses of mucus representing degenerate cancer cells, were clearly recognisable. Some of these groups lay in spaces enclosed by visible endothelium. In a direction away from the growth, whether up or down the bowel, the groups of cancer cells in the mucous coat became gradually smaller, and the intervals between them longer. At several points near the primary growth cancer cells were detected deep to the muscularis mucosæ, penetrating from the mucous into the submucous coat. Close to the primary growth the subperitoneal lymphatic plexus showed permeation. Here, too, cancerous invasion of the muscular coat and of the meso-rectum was evident. In these situations the cancer cells had taken on the blue hæmatoxylin stain, not the red mucicarmine. That is to say, while the cancer cells in the mucous lymphatic plexus had undergone mucoid degeneration, most of the cancer cells in the muscular coat and in the meso-rectum were in a healthy state. These facts seem to indicate a difference in food-supply. The cells in the mucous plexus are bathed in a fluid which has already provided food for and received excretions from the normal epithelium lining the intestine. The cancer cells in the muscular coat and meso-rectum, on the contrary, are "fat and well-liking," because in these situations they have to face no competition with normal epithelium. Examination of this specimen showed that: 1. Permeation occurs in rectal cancer, as in other forms of carcinoma. 2. Permeation may extend very widely in the mucous plexus above and below the growth, reaching in a comparatively early stage of the disease a point at least 5 inches removed from the edge of the primary growth. The affected length of bowel appears quite healthy to ordinary naked-eye and histological examination. 3. Permeation of the mucous lymphatic plexus as a factor in dissemination is probably limited in effectiveness by the habitual early degeneration of cancer cells in this situation. 4. In the muscular and peritoneal coats cancerous invasion does not extend far from the primary growth. 5. Effective dissemination probably, as a rule, occurs through the meso-rectum or peri-rectal tissue opposite the primary growth, and this is the tissue which requires most careful removal. 6. In view of the extent of mucous permeation revealed, excision of a considerable length of the bowel above, and of the bowel down to and including the sphincters is evidently a right practice. This step has been performed frequently, but it has hitherto lacked the pathological foundation supplied by my observations. 7. The lymphatic plexus of the mucous coat of the large intestine is not situated deep to the mucous layer. It lies between the crypts of Lieberkühn and the muscularis mucosæ. In this matter the study of pathology has cleared up a doubtful point of anatomy.

These observations are sufficient to show that in cancer of the rectum, as in cancer of the breast, the problem is not the excision of an organ, but the extirpation of a diseased lymphatic area. The accurate delimitation of the probable limits of this area in each situation where cancer commonly arises within the abdomen is a problem of great practical interest.

CONCLUSION.

The record of these lectures is a mixed one of failure and success, but that is the history of most pioneer efforts. The livery of truth is usually neither black nor white, but a sober grey. Enough has been done to show the soundness of the principles employed. And, as time goes on, experience in the selection of cases will enable more certain results to be achieved, whilst operative technique will doubtless be improved. May I express the hope that the future of the operative procedures to which I have drawn your attention, and of which I have given a full description, may not be clouded by their indiscriminate application to unsuitable cases? I think too, in view of the special difficulties these operations present in the maintenance of rigid asepsis, and of the probably disastrous consequences of any failure in this respect, that they should only be carried out by surgeons in constant daily practice of the operative side of their profession.

ST. PANCRAS TUBERCULOSIS EXHIBITION.—An exhibition for the prevention of tuberculosis organised by the National Association for the Prevention of Consumption is being held in St. Pancras from April 14th to 23rd. Arrangements have been made for the use of the Maurice Hall, Working Men's College, Crowndale-road, where the exhibition will be open from 12 noon to 10 P.M. daily. Curators will be in attendance to explain the exhibits and popular lectures will be given on the cause, spread, treatment, cure, and prevention of tuberculosis each evening at 8.30 P.M., by Dr. J. E. Squire, Dr. C. Theodore Williams, Dr. T. D. Lister, Dr. Hector Mackenzie, Dr. Jane Walker, Dr. T. N. Kelynack, and others. Admission is free.

LUMBAR PUNCTURE IN MENINGITIS AND ALLIED CONDITIONS:

A CLINICAL STUDY IN CHILDREN.

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THE cases upon which this paper is founded were all seen at the Queen's Hospital for Children, London, from the end of January to the beginning of August, 1908. They comprised 4 cases of acute poliomyelitis, 4 of chronic hydrocephalus, several of so-called "meningism," and 50 of meningitis, consisting of 23 tuberculous, 10 post-basic, 7 pneumococcal, 1 each due to pneumobacillus, streptococcus, staphylococcus, and acute serous meningitis, 6 not being definitely diagnosed.

Lumbar puncture, performed in all but six of these, was followed, as a rule, by immediate examination of the fluid. The method employed was as follows. The patient lay on the side with the knees drawn up and the spine fully flexed; a line joining the summits of the iliac crests was taken as the guide to the point of entry, the space above or below—i.e., third or fourth—being used. The skin, having been previously washed, was again cleansed and dried with ether, a fine exploring needle with a stilette being inserted either in the mid-line or just to one side. If no fluid appeared twisting the needle on its axis sometimes enabled it to pierce the theca, which may be pushed before it. Anæsthetics were not generally used, but as they apparently do no harm it is kinder to employ them. In meningitis, however, immediate relief seems to follow the escape of the fluid. Suction was never employed to obtain fluid except post mortem. If blood appears the space above may be explored. Needles, centrifuge tubes, and pipettes were sterilised and cleaned with acid solution before and after use; dry sterilisation is preferable; otherwise, to prevent crystalline deposit from the boiling water entering the tubes plugs of sterilised wool were inserted. The first few drops were allowed to escape or collected separately, and the rest was collected directly into the sterile centrifuge tubes, or some was allowed to fall direct on culture media. The tubes, being covered with sterile rubber caps, were then centrifuged, one being kept lest a coagulum should form. A clear fluid was centrifuged for 5 to 15 minutes; a turbid fluid less; the supernatant fluid being decanted off and examined for albumen, &c., the deposit taken up with a capillary pipette and spread—if scanty—on one slide, more often on two; or a culture tube inoculated with it. As a rule, Jenner's or Leishman's stains were used, and where bacteria were present Gram's differential stain.

The risks of lumbar puncture in meningitis seem very slight if it be performed gradually, but in cerebral tumours it may be very real. It should be avoided where there is closure, partial or complete, of the communications at the base of the brain, between the cranial and the spinal portions of the cerebro-spinal canal, in which case lumbar puncture only drains the spinal canal and so does no good—sometimes not even diagnostically—and, in fact, does harm by allowing a distended brain to be pushed down into the foramen magnum, causing the sudden "automatic closure" described by Quincke,[1] with fatal results.

Changes in albumen content have not appeared to assist the diagnosis; if, as in urine, it were normally absent, the mere finding of it would be of value. As it is, one has to ascertain if it is increased, which is difficult unless marked, and where definitely positive other more reliable proofs have been available. Of 29 cases of meningitis it was appreciably increased in 15, varying even in the same case in different tappings. Increased albumen and increased cell content usually go hand in hand, but bear no definite ratio. There seemed to be a slight increase in 2 or 3 cases of "meningism," and in 2 out of 4 of acute poliomyelitis. The boiling test with acetic acid was employed. The reduction of Fehling's solution was seldom tried. Several observers have found it unreliable.[2]

The amount of fluid and its pressure were judged by the rate of flow from the needle. This is normally drop by drop, and is affected by the calibre of the needle, viscosity of the fluid, coughing or crying by the patient, and the patency or not of the communications at the base of the brain. "In acute diseases there may be moderate increase in pressure with severe clinical symptoms; while in chronic diseases markedly increased pressure may exist with only slight pressure symptoms, and in the latter there is frequently a gradual compensation of the brain."[1] In 32 cases of meningitis the amount of fluid was increased in 18, the pressure in 17. In two cases of acute poliomyelitis the fluid was increased—even spurting in one. The greatest increase was in acute serous meningitis. In "meningism" the amount was appreciably increased and sometimes the pressure.

The naked-eye appearance of the fluid is a very unreliable test. Turbidity may be due to leucocytosis or to blood, but either may be present and the fluid seem clear. Blood in the escaping spinal fluid may be of local origin; slight if only taken up by the needle *en route;* copious, dark, and readily coagulating if from the extra-dural venous plexus. It may be due to pre-existing subarachnoid hæmorrhage—meningeal, ventricular, or spinal. If the hæmorrhage be more than two days old the red cells will be laked, and the deposit after centrifuging consist of red cells and their débris, with supernatant fluid tinged by the pigment.[3] Even a subdural hæmorrhage may give a tinged fluid owing to diffusion of pigment, but there will be no red cells in the spinal fluid.[1] With a hæmorrhage complicating meningitis the fluid is said to be uniformly tinged with blood and tends to coagulate, the clot containing blood cells and leucocytes derived from the meningeal effusion; the supernatant fluid being also tinged yellow.[4] In hæmorrhage associated with cerebral injury, or in cerebral hæmorrhage, the pinkish fluid does not usually tend to coagulate; if recent, red cells are present, which on centrifuging fall to the bottom, leaving a clear fluid; if older, the supernatant fluid will be tinged yellow and the red cells laked. The determination of the source is often very difficult; and I have often found it almost impossible to say whether a slight contamination was merely local or due to a pre-existing hæmorrhage.

By far the most important characters of the spinal fluid, clinically, are its cytology and its bacteriology. These should be investigated as soon as possible, as changes rapidly take place in the cells, rendering them difficult to identify, and organisms may die out or become incapable of cultivation, or contaminations occur. Normally lymphocytes are difficult to find: some say there should not be any. Any polymorphs are pathological, though some may be due to an accidental blood contamination. In this series cell counts were made from smears from the centrifuged deposit. Stewart[5] found the more accurate counts, with special counting cells, merely corroborated the rougher method; which has the advantage of supplying permanent results, combined with a bacteriological record. The cytology embraces cell-content and cell-type, the latter being the more important. Just as meningitis has been classed as vertical or basal according to the aspect of the brain involved, so special types of leucocytosis have been allocated to particular diseases. While these distinctions may hold true for the majority of cases, they are unreliable in the diagnosis of individual cases. The point of importance, as a rule, is whether it is a mononuclear or a polymorph leucocytosis. Roughly speaking, a polymorph effusion suggests a microbic infection other than tubercle, though this series includes 7 cases of tuberculous meningitis with polymorphs from 40 to 85 per cent. French[6] observers have also described an aseptic polymorph effusion with "intact" cells, which they ascribe to toxins acting at a distance from a localised focus and having a favourable prognosis. Mononuclears occur in tubercle, syphilis of the central nervous system, the parasyphilitic affections, herpes zoster, acute poliomyelitis, mumps,[7 8 54] lymphatic leukæmia, chloroma,[9] trypanosomiasis,[10] some cerebral tumours,[5] &c. They may also replace the polymorphs in the later stages of microbial infection, and are then considered of good prognosis. I have found a slight increase of lymphocytes in "meningism."

Somewhat different views obtain as to the exact significance of the polymorph in the spinal fluid. Buzzard[7] regards it as the expression of a phagocytosis in response to a microbial invasion; the mononuclear perhaps preceding it, due to irritation of the meninges, as seen in herpes zoster and acute poliomyelitis. To others it expresses the acuteness or intensity of a process, whether mechanical or microbial, the mononuclear speaking for a subacute or chronic condition. In support of this latter view Purves Stewart[5]

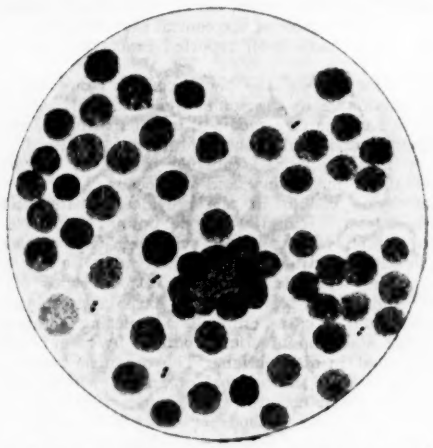

FIG. 1.—Pneumococcal meningitis. Secondary. (Jenner's stain.)—A. H. Second tapping. Atypical mononuclear effusion three days before death. Two or three diplococci in this field. Clinical symptoms latent. Otorrhœa and pneumonia present.

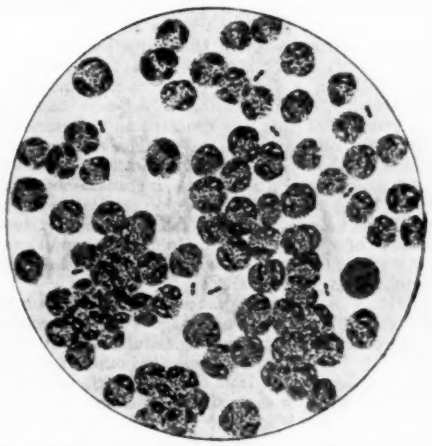

FIG. 2.—Pneumococcal meningitis. Primary. (Jenner's stain.)—E. F. Typical polymorph effusion (over 90 per cent.). Comparatively few diplococci; few hours before death. Clinically, marked meningitic symptoms.

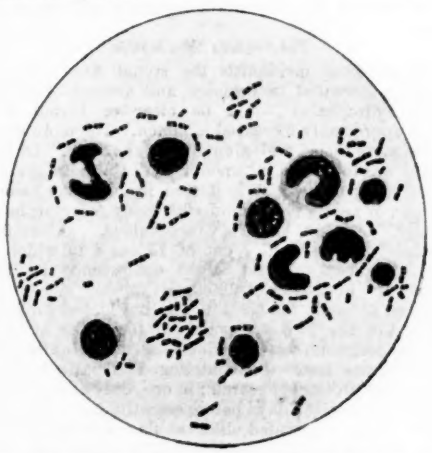

FIG. 3.—Pneumobacillus meningitis. (Leishman's stain.)—H. P. Second tapping; immediately after death. Moderate leucocytosis. Mononuclears slightly predominate. Large numbers diplobacillus. Clinically, bronchitis, diarrhœa, hydrocephaloid condition.

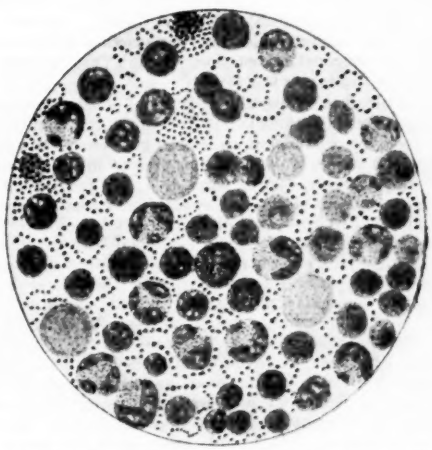

FIG. 4.—Streptococcal meningitis. (Jenner's stain.)—A. W. Large leucocytosis; mononuclears 80 per cent. Copious streptococci in chains, &c. Few hours before death. (More polymorphs in this "field" than elsewhere.) Clinically, periostitis tibiæ; latent symptoms.

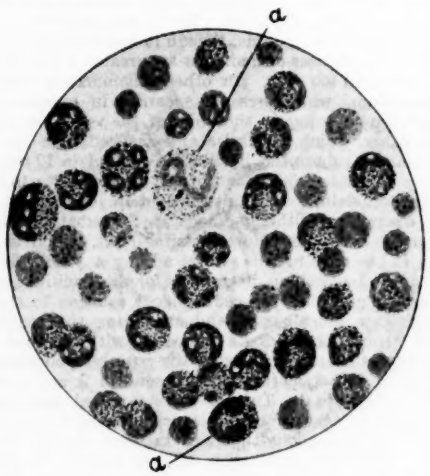

FIG. 5.—Tuberculous meningitis. (Jenner's stain.)—J. G. First tapping; mixed infection. Diplococci in two cells (*a*). Polymorphs, 45 per cent.; in third tapping reduced to 25 per cent. Gram-negative diplococci in culture from this fluid; also in smears post mortem. Copious tubercle bacilli in coagulum. (See Fig. 6.)

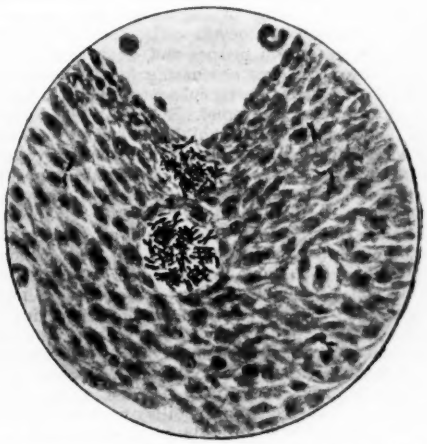

FIG. 6.—Tuberculous meningitis. (Carbol-fuchsin and methylene blue).—J. G. Coagulum teased and stained Ziehl-Neelsen method. Shows two clumps of tubercle bacilli and some scattered.

N.B.—These figures are reproduced from colour drawings of actual "fields" drawn with 1-12th oil immersion lens by the author.

instances the production of a spinal polynucleosis after intraspinal injection of sterile particles in monkeys, also the polynuclear effusion seen in the acute pyrexial attacks in paresis. Peyton Rous [8] also avers that the irritation caused by the needle in a lumbar puncture may induce a polynuclear effusion, thus affecting subsequent tappings; no definite instance of this has occurred in this series even in fluids removed on successive days. The study of inflammation seems to show that, in acute conditions, the polymorph usually appears early, whether the irritant be mechanical or microbial, being replaced by the mononuclear in the chronic or convalescent stage, though some irritants may determine the presence of a particular cell. In chronic conditions, however, or "where toxins have been acting over a long period," the mononuclear predominates.[10]

In addition to the blood leucocytes, local tissue cells or endothelial cells may act as phagocytes,[11 34] proliferating for the purpose, and may cope successfully with an infection, especially if the onset be gradual; otherwise they are reinforced by leucocytes from the blood. Should the infection be too virulent, or the resistance delayed or exhausted, there may be no leucocytic reaction, as in fulminant meningitis. Maiella [12] found that in dogs little or no spinal leucocytosis occurred if the meningitis proved fatal within two or three days. Marinesco,[13] also in animals, found that inoculation of the subarachnoid space with various bacteria gave results varying from no leucocytic reaction at all to a meningo-myelitis and a leucocytosis varying in nature and extent with the organism and its virulence. Bacteria even invaded the subarachnoid and perivascular spaces without causing a leucocytic reaction, though the tissues were affected by the toxins secreted.

In the blood, also, particular types of leucocytosis respond to particular infections; but I cannot find mention of a relation being considered as existing between the type of leucocytosis in the blood and that present in the spinal fluid. There are, however, several parallels. The polymorph is the prominent cell in blood and spinal leucocytosis in epidemic and sporadic cerebro-spinal meningitis, and La Fètra [14] found that when serum treatment was beneficial both the blood and spinal leucocytosis were reduced, both rising again in the relapses. Polymorph leucocytosis of the blood is often present in tubercular meningitis,[15 25] and may occur in the spinal fluid, the typical spinal lymphocytosis being comparable with the relative increase of the lymphocytes in the blood seen in favourable cases of tuberculosis.[10 16] Lymphocytosis of both blood and spinal fluid occurs in lymphatic leukæmia and in trypanosomiasis, in which diseases the lymphatic tissues appear to bear the brunt of the infection. It would seem that in acute toxic and infective conditions of the nervous system an early round-celled infiltration, perivascular and meningeal, is the prominent characteristic [17 18 19]—e.g., acute poliomyelitis, these lymphocyte-like cells being derived mainly "by proliferation of cells present in the perivascular sheath and walls of the vessels," any appreciable influx of polymorphs from the blood being of relatively late occurrence.[17] Apparently these lymphocytic cells, local in origin and found in the arachnoid meshes and fluid, provide the first line of defence, perhaps accounting for the comparatively long list of conditions, mostly subacute or chronic, in which a mononuclear effusion is found. Even a pyogenic meningitis may, if slowly progressing, exhibit a mononuclear effusion, as in a case, described later (see Fig. 1), where three tappings gave a mononuclear spinal effusion, polymorphs appearing 24 hours before death, as if, after an unsuccessful defence by the local cells, a general reaction had followed. In another case with latent symptoms the spinal fluid at death contained copious streptococci and yet over 80 per cent. mononuclear cells (see Fig. 4). So a mononuclear type early in the case, far from being of good prognosis, may mean an inefficient support to the first line of defence. The mode of invasion might probably influence the type of effusion, an intense or sudden invasion (? hæmatogenous) probably causing a general reaction and polymorph effusion; while a mononuclear type may be due to a particular infection (e.g., tubercle or syphilis) or may represent a "local" response to a subacute or more gradual invasion (? lymphogenous), the appearance later of polymorphs suggesting failure of the first line of defence and a consequent general reaction, due either to the spread of the original infection or to the arrival of a fresh enemy in the shape of a mixed infection.

In addition to leucocytes, cancer cells may be found in the spinal fluid in cancer of the central nervous system,[20 33] and "yeast cells" have been reported in blastomycosis of the brain.[21]

Bacteriology offers the most conclusive of all positive results obtainable by the spinal fluid. Sometimes using the fluid itself as a culture medium, by incubating it, may yield organisms which would otherwise have been missed. I have by this means obtained tubercle bacilli in smears after several days' incubation and a coccus after 24 hours, neither being visible in the previous smears, and both confirmed later. Bacteria may be present without a leucocytosis, while, failing other evidence, the opsonic and agglutinative reactions of the fluid may be of positive value. Many bacteria, including various types of Gram-negative and Gram-positive cocci, have been isolated from the spinal fluid in cases clinically simulating cerebro-spinal meningitis, since the infection produced by them is generally cerebro-spinal in distribution. The organism isolated, however, may not be the original organism, which may have died out or resist culture (even though visible in smears), either due to faulty methods or delay in investigating, the organism found being only a secondary or terminal infection.[22] Bacteria responsible for spinal disease are especially prone to die out early. In some mixed infections the organisms seem to reinforce one another, as in the case of the diplococcus crassus and meningococcus,[23 36] which may also be true of the leptothrix organism and the meningococcus.[24]

Tuberculous Meningitis.

In tuberculous meningitis the spinal fluid may appear normal or increased in pressure and amount—one form of "acute hydrophalus"—and be clear or turbid with or without appreciably increased albumen. The more acute the case the more turbid and albuminous the fluid. In 16 cases the fluid was increased in amount in 7; and in pressure in 5; clear in 2; opalescent or turbid in 14. The association of a clear, or nearly clear, fluid with many polymorphs proves generally, I think, to be tuberculous. Albumin was appreciably increased in 7 out of 13 cases in which it was noted. Robinson [25] found slight opalescence in 12 and turbidity in 4 in a series of 19 cases.

Of these 23 cases, the bacillus was not looked for in 9. It was found in the 14 cases examined for it; in all of 10 in which the coagulum was examined—as a rule quite readily; and in smears from the centrifuged deposit in 4—after repeated and protracted search; in one, only after incubating the fluid for several days before centrifuging. The typical veil-like clot, suspended like a fine cobweb from the surface of the fluid, is itself strongly suggestive. It was present in the 10 cases examined for it; Robinson obtained it in 18 out of 19 cases. Removed with a pipette, teased out on a slide and stained by the Ziehl-Neelson method, it provides a most reliable and expeditious method of finding the bacillus, which may be present in it in twos or threes, or in large numbers (see Fig. 6). In one case the first tapping failed to reveal the bacillus, though it was found in the next. Probably the chances of finding it are greater if the coagulum be not removed too soon. In other inflammatory conditions the coagulum, when present, occurred in opaque, friable flakes, often adhering to the sides of the vessel, in contrast to the other, which is elastic and suspended in the fluid. Using this coagulum, the bacillus was found in 17 out of 19 cases by Robinson; in 25 out of 31 by Forbes [26]; in 38 out of 40 by Bernstein,[27] who adds the centrifuged deposit to the teased coagulum. Other methods are: incubating the fluid for four or five days before centrifuging it, which was successful in one case in this series; adding a sterile fleece to the fluid and searching its meshes for the bacillus; adding an equal volume of 5 per cent. phenol solution to the fluid to precipitate the albumen and examining the centrifuged deposit [28]; and inoculating a guinea-pig with the fluid.

In 19 cases examined a practically pure lymphocytosis was obtained in 7, polymorphs were present in 9, and no cytological evidence in 3. These 3 cases revealed, post mortem, widespread miliary tuberculosis, with definite tuberculous meningitis with copious tubercles in one; and in the other two an early meningitis with opacity of the membranes, and turbid effusion at the bases, spreading into the Sylvian fissures, but without macroscopic meningeal tubercles, definite optic neuritis being present in one of them. At least three cases of tuberculous meningitis without tubercles have been reported [29 37]; in all there was an absence

of tubercle formation throughout, the condition being recognised by microscopical examination, and in one case[30] by recovery of the bacillus from the spinal fluid. Since in my cases microscopical investigation of the tissues was not employed, nor the spinal fluid bacteriologically examined, the condition may possibly have been a serous meningitis, caused by toxins rather than by an actual invasion by the bacillus. Absence of leucocytes is reported by Forbes (2 cases) and by Rénon and Tixier,[31] who in one case obtained no cytological evidence in seven tappings during the last 25 days of the disease. In 16 cases lumbar puncture was performed 33 times, varying from one to four times per case, depending on the clinical symptoms, which the operation temporarily relieved. Polymorphs were found in 9 cases, varying from 4 per cent. to 85 per cent., being the predominant cell in 4 cases, and reaching over 40 per cent. in 2 others, a pure lymphocytosis prevailing in the remaining 7 cases.

What do these polymorphs denote? They may be present at the outset and persist, or may only appear late. They can hardly represent a change from a local to a general reaction, the meningitis usually being only a part of a general tuberculosis; and against their representing acuteness is the fact that some cases show a pure lymphocytosis which from clinical and pathological evidence are equally acute or severe infections. In one such case of 16 days' duration, clinically very acute, with copious bacilli in the spinal fluid and much lymph post mortem only lymphocytes were present in three tappings and less than 10 per cent. polymorphs in the fourth. In another, clinically a mild case with indefinite symptoms till within three days of death, polymorphs in three tappings ranged from 50 per cent. to over 75 per cent., a large cavity at the base of one lung being found at the necropsy. If the rapidity of the course is any criterion of its acuteness, some of the cases with lymphocytes were as acute as those with polymorphs; and this is confirmed by the clinical features. Thus the average duration in 4 cases with pure lymphocytosis was 14 days, the 2 tested proving sterile in culture. In 3 others the duration averaged over 3 weeks. Of 8 cases with polymorph leucocytosis, in 4 with the duration ranging from 5 to 14 days, polymorphs predominated in only 1; while they predominated in 3 out of 4 others, whose duration ranged from 3 to 6 weeks. Of these 8 cases, in 5 a mixed infection was suggested by obtaining a culture in these, 2 others proving sterile, organisms being seen also in smears in 4 and confirmed by culture in 3.

The organisms found in smears were in two cases Gram-positive cocci somewhat resembling the pneumococcus; the cultures were taken after the fluid had been standing and were contaminated. In another a faintly staining bacillus, in some places apparently branching, no culture being taken in this case. The other organism seen in smears was an intracellular coccus seen only in the first tapping (see Fig. 5), being at first regarded as a post-basic case, giving a feeble growth originally on nasgar, but more vigorous in subculture; growing also on Drigalski medium as a Gram-negative bean-shaped diplococcus. It was found also extracellular in smears from the ventricular fluid post mortem. Double otorrhœa was present and copious tubercle bacilli (see Fig. 6) in the spinal fluid. The last, not seen in smears, was obtained in culture on nasgar as a feeble growth, being more vigorous in subculture, growing also on Drigalski medium as a Gram-negative bean-shaped diplococcus, appearing in pairs and tetrads. In these last two the primary growth consisted of one or two discrete whitish circular colonies with smooth outline, but developing more yellow pigment than did the cultures in post-basic cases.

So the presence of polymorphs in tuberculous meningitis may, in at least some cases, be accounted for by a mixed infection of the meninges (or of the patient) as found by others, Ross[32] and Bernard[33] finding a change of type from mononuclear to polymorph coincident with infection by pyogenic organisms. The infection may be from the ear, or a periostitis,[4] or a cavity in the lung,[34] since "the majority of cases of pulmonary tuberculosis are combined infections,"[35] this being the explanation given for a case of streptococcal meningitis complicating phthisis, no other source of infection being discoverable,[36] and may also account for the mixed infection in my case in which a large vomica existed in one lung.

A polymorph leucocytosis at the outset, especially if large, may be due to a hæmatogenous or sudden infection, as when large numbers of bacilli enter the blood-stream from rupture of a caseous gland into a vein, for polymorphs appear to exert no power over the tubercle bacillus, unless, perhaps, when in the blood.[34] A lymphogenous or more gradual infection is probably more often the case. Maiella[12] found experimentally that a cortical encephalitis gave rise to a polymorph effusion, and that a cerebral abscess without cortical encephalitis was unaccompanied by a spinal leucocytosis. Tuberculous meningitis is really a meningo-encephalitis, the encephalitis varying in degree and extent. That the presence of polymorphs may bear some relation to the amount of encephalitis was suggested by a case of six weeks' duration, in which necropsy revealed extreme softening, more marked on one side, and extensive meningitis with copious tubercles; clinically, head retraction and convulsive movements were marked, the spinal fluid turbid, with a large pure lymphocytosis in the two first tappings and 50 per cent. and 60 per cent. polymorphs in the two last, being sterile in culture and with large numbers of tubercle bacilli in each tapping.

While the cytology of tuberculous meningitis is not pathognomonic, the association of the typical coagulum with a lymphocytosis is very suggestive, the discovery of the bacillus being conclusive, and by searching the coagulum definite proof should be available in most cases.

In the 23 cases the average age was 2½ years; 7 being under 1 year and the youngest 3½ months. The duration, so far as ascertainable, was from 5 days to 6 weeks. The most rapid case (aged 2 years) was well on Saturday, being a little drowsy in the evening; facial paralysis developed next day, for which she was admitted; she was then slightly tremulous on sitting up, with a rather vacant, drowsy look and slight squint. Lumbar puncture gave a scanty clear fluid with 45 per cent. polymorphs, no cocci, and albumen slightly increased. Only 1 or 2 tubercle bacilli were found in a smear. She was removed home on the Monday morning and died on Wednesday with symptoms of meningitis. Two cases dated from a definite cerebral injury received when in apparently perfect health, and ran an acute course of 13 and 14 days, necropsy revealing marked vertical as well as basal meningitis; the cerebral condition being much in advance of the changes elsewhere, one showing a small calcareous focus in one lung, the other a caseous mediastinal gland. Tubercle of the choroid was present in 2 cases, without changes in the disc, in one a large pigmented obsolescent tubercle being accompanied by several recent "satellites." Optic neuritis was present in 6, one being of the "choked disc" variety. Squint was noted at some period of the illness in 17, and facial paralysis in 3, being persistent in 1. A modified hemiplegia was present in 3 cases, lasting from a few hours to 2 or 3 days. Hemiplegia and facial paralysis seem to be generally of early onset and short duration; 1 case was brought to hospital for the facial palsy, another for the hemiplegia; while a case which on admission closely resembled this—with paresis of the left arm and leg, cervical rigidity, and a small spinal lymphocytosis—proved to be acute poliomyelitis. Robinson[23] found a partial or complete hemiplegia in 5 cases, and a cataleptic condition in 1; this was also noticed once in this series. Physical signs may be very latent even with definite pulmonary involvement; of 2 cases of meningitis with signs of consolidation, 1 having a spinal lymphocytosis was pneumococcal meningitis; the other, admitted as marasmus (aged 9 months), had no spinal leucocytosis at all, necropsy revealing a typical tuberculous meningitis. Another case, admitted as whooping-cough and bronchopneumonia with intense cyanosis, had double optic neuritis, blood-stained spinal fluid without appreciable leucocytosis, and at the necropsy obvious meningitis without meningeal tubercles, but with widespread tubercles elsewhere.

Lumbar puncture often gave marked, though temporary, relief, especially where much movement was present, but it never restored consciousness.

With regard to prognosis, hope is usually regarded as being proportional to the chances of a mistaken diagnosis, the meningitis being only one, often a late, manifestation of a general tuberculosis. That it may, however, be the chief, or perhaps the only, lesion was suggested by two cases where the necropsy showed advanced meningeal changes with very slight evidence elsewhere. Tooth[37] has recorded a case of 33 days' duration with only meningeal tubercle at the necropsy, and normal temperature throughout. Such subacute cases resemble tuberculous peritonitis, which also may occur alone or as part of a general infection, and in which, especially the form with fluid, good results have followed laparotomy. Stiles[38] had two recoveries after trephining and allowing escape of fluid in which the tubercle bacillus was found. A case (M. M.) described later was possibly of this nature. Martin[2] has collected a number of cases of tuberculous meningitis with remissions and death from relapses after intervals of from four months to two years, diagnosis depending on inoculation of guinea-pigs with the spinal fluid, isolation of the bacillus in one case, and discovery of the old meningitis at the necropsy; also several instances of recovery verified by isolating the bacillus from the spinal fluid. Some of these may have been localised tuberculous meningo-encephalitis, described by Oppenheim[39] as circumscribed, favouring the convexity and often simulating cerebral tumour, which he had verified years after on necropsy, and in which operation with ablation had resulted in recovery in some cases, and in an extension of the process in others; while some may have been a serous meningitis due to toxins, an "acute tuberculous fever"—Osler[35] stating that "in

the fluid obtained by lumbar puncture the tubercle bacillus may be abundant, even when there is no active meningitis."

M. M., aged 9 years, with a tuberculous family history, "always delicate," had severe headache for nearly 3 weeks, and vomiting, ataxia, and drowsiness for several days before admission, when cerebral vomiting, lateral nystagmus, unilateral weakness of facial muscles and foul double otorrhœa were present, with a high spinal lymphocytosis. Unconsciousness, incontinence, and choked disc developed and meningitic cry; then a marked, but temporary, improvement for 2 days, followed by relapse to the former condition, with increased papillitis. Radical mastoid operation was then performed on one side, but no pus was found; the membranes appeared to be healthy but slightly bulging, and on incision a large amount of clear fluid escaped. From this time improvement began and persisted. The spinal fluid, examined 3 times before operation, showed a high pure lymphocytosis, no organism being seen; again, 2 weeks and 4 weeks after the operation, it was the same with still a large excess of fluid. Two smears from the last tapping, however, showed a few more polymorphs and several large organisms, apparently a coarse coccus or short thick bucillus. These, if not contaminations (and the fluid was examined immediately after removal) support Weichselbaum's statement that bacteria may be present in the spinal fluid without necessarily causing meningitis, for they gave rise to no symptoms, the child then being up and awaiting discharge. Cultures were not taken, nor was a coagulum looked for, it being prior to my adoption of that method, but in a smear from the fourth tapping what were believed to be 2 or 3 tubercle bacilli were seen. There were no pulmonary signs, no choroidal tubercles, the papillitis being in no wise diminished two weeks after the operation. The temperature never exceeded 99° F., and this with the severe symptoms and spinal lymphocytosis seems to negative an otitic meningitis. She left hospital 3 months after admission apparently quite well, her mother writing 14 months later that there is still double otorrhœa, that she is very delicate mentally and physically, and only just returning to school. One sister has since been under treatment for surgical tuberculosis.

This case in several particulars resembled a case of tuberculous meningitis, which for a time simulated cerebral tumour, with choked disc, nystagmus, facial palsy, and high lymphocytosis.

E. S., aged 10 years, probably a case of tuberculous meningitis with remission, was admitted in November with severe cerebral symptoms—vomiting, hemiplegia following a convulsion, head reaction, constipation, and marked double optic neuritis. Improvement ensued, the neuritis being followed by atrophy. The spinal fluid was not examined till 24 or 48 hours after removal, no leucocytosis or organism being found. When I first saw her in January she was regarded as a case of cerebellar tumour, and was tremulous, emotional, quite blind, at times very drowsy, and with cerebellar ataxy; there was also an old aortic bruit. The temperature never exceeded 99° F. No pulmonary signs were present. In March she developed a swinging pyrexia rising to 104°, with a relatively slow pulse. The Widal test was doubtfully positive in the third week of the pyrexia and negative 8 days later. There were some typhoid-like spots on the abdomen, which was rather full. Marked drowsiness was the only cerebral symptom and a modified Cheyne-Stokes type of respiration for a few days before death, which occurred in the fourth week of the pyrexia, 5 months after admission.

Necropsy revealed no tumour, but a collection of yellow lymph at the base and lower ends of the Sylvian fissures and a few whitish hard spots on the membrane; otherwise no tubercles. The pituitary body was hard and nodular and in section apparently caseous. The spleen was not enlarged. In the lower ileum and cæcum were several small ulcers. There was no macroscopic evidence of tubercle in the thorax or abdomen. The tubercle bacillus was not looked for, so this case has not been included in this series; but it would seem to be a case of tuberculous meningitis which had quieted down, with death from the intestinal condition, perhaps aided by old cardiac disease.

In tuberculous meningitis the Widal reaction may be positive, as found by Robinson[25] in 3 out of 8 cases, being positive twice in one case closely resembling typhoid; a blotchy rash also occurs which may be mistaken for typhoid spots.

The treatment in reported cases of recovery has varied from mercurial inunction and tuberculin injection to leeching and repeated lumbar puncture or trephining. Just as venesection is more effective, when indicated, than the slower method of leeching, so trephining may well be more effective than lumbar puncture, as seen in cases of cerebral tumour. Whitla[40] suggests the anæsthetic may be responsible for some of the benefit following laparotomy in tuberculous peritonitis; if so, why not in meningitis? Darling[41] and Da Costa[41] have both shown that a general anæsthetic is followed by an appreciable blood leucocytosis. Modern methods seem to negative the absolutely hopeless prognosis, and also encourage the hope that early trephining with drainage might save at least some lives which at present are merely allowed to drift. Judging from the reported cases, the subsequent mental condition is apparently good in those that recover, a further justification for interference.

Post-basic Meningitis.

In the 10 cases of post-basic meningitis the fluid was turbid in 8 and clear in 2, in large excess in 7, with raised pressure in 5. Hydrocephalus was present in all; in 2 only scanty fluid was obtained at first and "dry taps" after, apparently due to a collection of thick gelatinous lymph in the fourth ventricle, one of these being relieved by tapping the lateral ventricle. In 1 only a few drops of blood-stained fluid were obtained on two occasions, apparently due to "automatic closure" of the foramen magnum by the distended and softened brain being pushed down into it, the "tonsils" being elongated and moulded so as to fill the foramen "like a plug."[1] A polymorph leucocytosis was present in 8, polymorphs being in large excess with many intracellular cocci in 5.

In A.G. the first two tappings gave 60 per cent. and 75 per cent lymphocytes, with a very few intracellular cocci, visible only in the first tapping, but typical cultures obtained from both. The last tapping showed 90 per cent. polymorphs but no visible cocci, and preceded by some 48 hours a marked change for the worse in the symptoms, the post-mortem findings being typical. The clear fluid in one case was not examined for about 24 hours; the scanty cells then found were practically indistinguishable.

In J. D. the first tapping gave scanty fluid with 55–60 per cent. lymphocytes and no cocci visible in smears, but after about 24 hours' incubation Gram-positive cocci in pairs and chains were found. The second tapping gave only a few drops in which lymphocytes amounted to about 80 per cent., two subsequent attempts being "dry taps." Post mortem intra- and extra-cellular cocci were obtained in smears and culture from the lymph and ventricular fluid and were persistently Gram-positive.

Another case, resembling this in the latent character of the symptoms, gave in the first and second tappings scanty yellowish fluid in which lymphocytes predominated; no cocci were visible in smears, but a Gram-negative coccus, growing in pairs and tetrads, was obtained in culture Owing to the failure to relieve the hydrocephalus by lumbar puncture the lateral ventricle was tapped through the anterior fontanelle under an anæsthetic, a large amount of fluid escaping containing over 50 per cent. polymorphs, in some of which numerous diplococci were found, apparently Gram-negative, culture giving a Gram-negative diplococcus and staphylococcus, smears from the ventricular lymph post mortem showing a few intracellular cocci, apparently Gram-negative. This organism appeared to differ from the diplococcus of Still.

So in one case symptoms suggesting post-basic meningitis were due to a coccus Gram-positive and intracellular, and in another to an atypical Gram-negative diplococcus. In two cases cocci apparently absent from the smears from the freshly centrifuged fluid were obtained after incubation. In several cases smears from cases of tuberculous and post-basic meningitis have been very similar. Two fluids from the latter disease were examined for tubercle bacillus, and two cases of the former disease with marked retraction were at first suspected of being post-basic. The findings by lumbar puncture depend largely on the patency of the communication at the base of the brain, which may be interrupted by adhesions; or a thick gelatinous lymph which in two cases appeared to fill the fourth ventricle and block the escape of fluid; or by actual occlusion of the foramen magnum by the softened distended brain being pushed down into it and which lumbar puncture only tends to aggravate. All my cases died and in none did a preponderance of mononuclears justify a hopeful prognosis. Goggia is reported[2] as finding a mononuclear type of fluid throughout a fatal case of meningococcal meningitis. In one case there seemed very little amiss save slight cervical rigidity, a full fontanelle, and an objection to being handled; it actually put on weight. In the fifth week marked head-retraction and vomiting set in abruptly with symptoms of collapse and death four days later. The first two tappings showed a preponderance of lymphocytes, the last a change to 90 per cent. of polymorphs. A few cocci were seen only in the first tapping and a typical culture obtained, the post-mortem findings being typical.

The average age was 9 months, 2 cases being over one year (13 months and 2 years). The eldest, aged 2 years, was clinically the most acute, with high temperature, herpes and a purpuric eruption, and copious typical intracellular diplococci. As a rule the temperature remained low. Vomiting was generally marked and persistent, yet many seemed to take the bottle well, 2 cases actually putting on weight for a time. Optic neuritis was not noted, but marked pallor of the disc and apparent blindness were noted in 3. Necropsy in 8 showed marked ventricular distension, with absence of obvious meningitis on the vertex. In fact, the pale vertex appeared to suggest an anæmia, and in several cases the terminal stages closely resembled that seen in cases dying with diarrhœa (hydrocephaloid), in which "arterial anæmia of the brain" is said to be present,[42] as in the case with abrupt alteration in symptoms mentioned above. The result of puncturing the ventricle direct, though it probably prolonged life slightly, was not encouraging.

Hydrocephalus.

Four cases of chronic hydrocephalus, apparently following post-basic meningitis, were admitted. In one, a feeble-minded girl of 8 years, concealed hydrocephalus apparently existed, the result of simple meningitis in infancy. The spinal fluid was in appreciable excess, clear, devoid of cells and of albumen. It was suggested she was less fidgety after its removal. Two others were seen 4 and 12 months after

meningitis, the cranium in the former being very large, with patent sutures, the removal of large amounts (from 3 to 5 ounces) of fluid at intervals producing at first apparently a slight improvement. Once the fluid showed a glistening turbidity, apparently due to a degenerated cellular débris. The last case, seen three months after meningitis, was tapped five times without any ultimate improvement. In the first tapping were a few mononuclears; the second next day showed a high polymorph leucocytosis; no organisms were seen and it was sterile in culture. These polymorphs may have resulted from irritation due to the previous day's tapping, as described by P. Rous [8]; if so, it was the only instance in this series. The subsequent tappings contained mononuclears like the first. All the cases left hospital *in statu quo*.

In acute hydrocephalus, puncture should be performed early and repeated to prevent over-distension, which when once formed tends to persist, on account of the inelastic nature of the cerebral substance. But in long-standing hydrocephalus, when parts of the brain have undergone atrophy from prolonged pressure, and when secretion continues from over-dilated cavities, lumbar puncture is generally only of transient benefit. In young children, however, it may, by relieving over-distension, allow of more development of the brain substance than would take place if the pressure remained constant.[1] Or perhaps, by removing large amounts of fluid, a condition of cerebral hyperæmia may be induced with consequent improved nutrition of the cerebral tissues.[43] Concealed hydrocephalus may be similarly benefited. To obtain any lasting benefit it would probably be necessary to repeat the process, at intervals, over a long period.

Pyogenic Meningitis.

Under the head of pyogenic meningitis are grouped the infections due to the pyogenic organisms, of which *pneumococcal meningitis* is the commonest form, being third in order of frequency of all forms of meningitis. This series included 7 attributed to the pneumococcus, as judged by the findings in smears and culture. Two were primary, no other focus being discoverable, and directly followed definite cerebral injury received while in perfect health. The other 5 were secondary—2 to localised empyema; 3 to purulent otitis, in 2 with long-standing otorrhœa, in the other, only discovered unexpectedly at necropsy. These primary and secondary cases differed both clinically and in the results of lumbar puncture. In the primary cases symptoms appeared abruptly, about 24 hours after the injury, were marked, fits being prominent, and ran a rapid course, being fatal on the third and fourth day. The spinal fluid showed typical changes, being turbid, increased in amount, in pressure, and in albumen, and with a high polymorph leucocytosis (over 90 per cent.), one with copious organisms, the other with comparatively few. (See Fig. 2.) Both had a thick layer of pus covering the vertex and infiltrating the membranes throughout. In one there was a large polymorph leucocytosis of the blood, and apparently some intracellular organisms visible in smears. The secondary cases generally ran a longer course, with symptoms latent or absent till near the end, the evidence of lumbar puncture being often unreliable till near the close. The above apparently holds true for all forms of pyogenic meningitis, which, as a rule, is a secondary or terminal infection, though marked variations occur according to the virulence of the infection. The average duration in the secondary cases was about 9 days, the onset being difficult to determine.

A. G. (1), aged 1½ years, admitted with suspicious history, during 8 days in hospital showed no signs of meningitis except marked irritability, sat up in bed to within 36 hours of death, ran a low temperature, and 4 days before death yielded a spinal fluid increased in amount and pressure, but otherwise normal. One did not feel justified in repeating the lumbar puncture. Necropsy revealed purulent vertical meningitis and turbid spinal fluid teeming with organisms, pyopericardium, and a localised inspissated empyema of about the size of a crown piece, which had apparently been twice punctured by the exploring needle without result. The lungs were crepitant throughout.

A similar case, A. B., aged 4 months, with broncho-pneumonia, after 2 or 3 weeks' illness, developed head retraction; tubercle was suspected, but necropsy disclosed a small inspissated empyema of about the size of a penny, and purulent basal meningitis. Lumbar puncture twice performed gave only a few drops of blood-stained fluid, which was not examined.

Of the 3 cases associated with purulent otitis, in H.D., aged 2 years, the otitis was unsuspected during life. Operated on 12 months previously for empyema, he had been under treatment for persistent pulmonary symptoms suggesting fibroid lung, and when apparently convalescent developed symptoms which suggested tuberculous meningitis: next day lumbar puncture gave turbid increased albuminous fluid with a high polymorph leucocytosis and swarming with diplococci, death following 3 days later. Necropsy that day discovered an intense purulent meningitis, pus in one ear, and marked pulmonary fibrosis. Here meningeal symptoms definitely appeared only 4 days before death.

A. G. (2), aged 6 years, with long-standing otorrhœa, developed meningitic symptoms 3 weeks after the third operation for it, lumbar puncture 2 days later giving a turbid fluid with large polymorph leucocytosis—the cells being unusually well preserved—and with only a few pneumococci. Trephining showed apparently healthy membranes and exploration for abscess was negative, the condition being unrelieved. Death occurred 4 days later, necropsy disclosing a basal purulent meningitis, pneumococci being isolated from the pus as from the spinal fluid.

A. H., aged 7 months, was admitted with a history of vomiting, retraction, and double otorrhœa, which had stopped on one side 2 days previously. Septic meningitis was suspected, but a spinal lymphocytosis and the development of signs of pulmonary consolidation suggested tuberculous meningitis. No tubercle bacilli were found, but in a corner of a smear from the second tapping 2 or 3 diplococci were seen among the lymphocytes. (See Fig. 1.) The third tapping gave only a few drops still mononuclear in type. On the seventh day of admission, and 24 hours before death, the symptoms, hitherto most indefinite, became marked, with fits, squinting, &c., the spinal fluid then showing a high polymorph leucocytosis with copious diplococci.

Necropsy revealed marked purulent vertical meningitis, and no evidence of a ruptured abscess or of pus in the ear. This case has been previously referred to as showing a lymphocytosis even in the presence of pyogenic bacteria. It also is an instance of the association of pneumonia and meningitis.

The temperature in the two primary cases varied from 103° to 105° F. in one, and from 104° to 107° in the other. In the secondary cases the pyrexia appeared to be influenced less by the meningeal infection than by concomitant conditions (e.g., pulmonary) elsewhere. In the two cases associated with empyema, pyrexia was marked in the one with broncho-pneumonia and very slight in the other, in which the lung was not affected. In the case with pneumonia and otorrhœa the temperature was high and the symptoms very indefinite. Lumbar puncture usually brought temporary relief and a fall of temperature; it gave no clue to the condition in 2 cases 4 days before death, and in another gave only a mononuclear type till the day before death. Culture of the fluid might have given positive evidence earlier.

Pneumococcal meningitis as a complication of pneumonia is generally described as rare, West [44] finding no instance in two series of 100 cases. Osler,[45] however, found 8 per cent. of cases in Montreal. It may be more frequent than is supposed, as, giving rise to no symptoms, it has been repeatedly found unexpectedly post mortem.[17 37] Herringham [45] quotes six cases, in only one of which was the complication suspected during life; while the meningitis, with or without symptoms, may require microscopical examination for its identification,[17 46] which is also true for other forms of meningitis. Eyre [47] found pneumococcal meningitis 14 times in 168 cases (other than pneumonia) due to the pneumococcus at Guy's Hospital in the four years 1904–07; and Forbes [26] in the same period at Great Ormond-street found 9 cases in 142, in which lumbar puncture was performed. Even with definite meningitis lumbar puncture may give a normal fluid as already quoted,[43] Forbes [26] also finding a normal fluid in 2 cases, and only a few lymphocytes in 2 others.

Reference may be made here to an undiagnosed case, possibly a pneumococcal meningitis, where repeated lumbar puncture gave negative results, no culture being taken.

C. Y., aged 3 years, admitted as (?) meningitis was found to have empyema, which was operated upon. The meningeal symptoms became more marked with extreme restlessness and retraction, which lumbar puncture, performed 4 times, at first relieved. A large excess of clear fluid escaped at high pressure, without leucocytosis or increase in albumen. Subsequent tappings yielded a similar fluid in smaller amounts with no amelioration of symptoms; the last tapping 2 days before death giving only a few drops, unconsciousness and marked retraction being present. This association of diminishing fluid with increasing symptoms Quincke regards as pointing to interruption of the communication between brain and cord at the base of the brain. Necropsy was refused. Definite optic neuritis was not present. The temperature (104° F. on admission) fell to 100° after operation; rising again, it fell after lumbar puncture, remaining at 99–100° till 2 days before death, when it rose to 102–103°. The pulse was weak and mostly irregular and unaffected by treatment. Pneumococci were obtained in the pus withdrawn from the empyema before operation. Was it a septic meningitis with unaltered spinal fluid, probably due to interruption of the communication at the base of the brain; or a serous meningitis?

Meningitis due to the pneumobacillus.—The bacillus of Friedländer is credited with the production of meningitis by Weichselbaum and Oppenheim. The following appears to be a case due to that organism.

H. P., aged 2 months, was admitted for bronchitis. After 10 days indefinite illness, in which the symptoms appeared to be out of proportion to the physical signs, diarrhœa set in, and 2 or 3 days later,

marked head retraction with depressed fontanelle and rising temperature. Lumbar puncture gave a clear watery fluid, increased in amount, no leucocytosis, only a few lymphocytes, and apparently laked red cells being present, the temperature (105° F.) falling after it, but without relieving symptoms. One suspected a hydrocephaloid condition associated with the diarrhœa, or, having regard to the pulmonary condition, tuberculous meningitis. The fundi were normal. Death occurred 3 days after lumbar puncture, preceded by convulsions and squinting, the fontanelle remaining depressed throughout.

The spinal fluid withdrawn a few minutes after death was scanty and blood stained, with copious diplo-bacilli and a small mixed leucocytosis, mononuclears predominating. (See Fig. 3.) The organism was Gram-negative, apparently a diplo-bacillus, and bi-polar staining where stained lightly with Leishman's stain. The fluid was not cultured.

At necropsy next day the brain showed marked congestion with increased turbid meningeal effusion, but no pus. Near the Sylvian fissure were found 2 or 3 small pustules resembling tubercles, but larger and more opaque, these in smear and culture giving an organism identical with that found in the spinal fluid. Death appeared to be immediately due to a bilateral intra-ventricular hæmorrhage, apparently accounting for the blood cells in the spinal fluid. There was no sign of tubercle. I am indebted to Dr. Lindsay Milne, late of the Pathology Department, Edinburgh University, who examined the culture from the meningitis, for the following description of the organism. "A bacillus non-motile, non-sporing, Gram-negative, giving a white growth on potato, slightly coagulating milk and slightly liquefying gelatin (probably due to a slight admixture with staphylococcus) and pathogenic to mice." Unfortunately, the culture was not sent up for examination till late. Arkwright[23] has isolated a Gram-negative oval bacillus from the spinal fluid of an infant dying with meningitic symptoms, but with no macroscopic meningitis at necropsy.

Streptococcal Meningitis.

A. W., aged 9 months, with a history of diarrhœa and vague ill-health, was admitted temporarily to a medical ward late at night with epiphysitis of the lower end of the tibia. In the ward it was noticed that the child failed to notice its surroundings and meningitis was suspected. At 5 A.M. fits developed and lumbar puncture at once performed gave a large excess of turbid yellowish fluid, with high leucocytosis with over 80 per cent. mononuclears and copious typical chains of streptococci, also isolated in pure culture. (See Fig. 4.) Death occurred less than 12 hours after admission, necropsy that day revealing general purulent meningitis; streptococci were obtained in culture from the spleen, meninges, and the subperiosteal pus from the tibia. The temperature on admission was 102° F., rising to 104°, falling to 102° after lumbar puncture. As in several of these cases the liver showed fatty changes and the abdominal glands some enlargement.

Staphylococcal Meningitis.

Lumbar puncture was not performed in the case of a girl admitted moribund, with a neglected septic periostitis of the femur, septic endocarditis, purpuric rash, and purulent meningitis. Death occurred soon after admission, staphylococci being obtained in smear and culture from meninges, heart valves, spleen, and subperiosteal pus. In this case, as in the last, the meninges contained purulent effusion, distinctly yellow in the sulci, and milky over the convolutions; there was not the thick purulent muff on the surface of the arachnoid seen in pneumococcal cases.

The following was a case probably of fulminant staphylococcal meningitis. F. T., aged 6 years, was admitted to a surgical ward with fits and vomiting five days after a cerebral injury, before which he was quite well, save for multiple abscesses of the scalp, still present. A large excess of blood-stained fluid at high pressure was removed on the night of admission, containing more polymorphs than the blood contamination would account for; only temporary relief followed. Next day a similar fluid was obtained; no cocci were seen; no culture was taken. Death occurred on the third day of the illness.

At the necropsy the brain showed marked congestion and a turbid meningeal effusion; no pus; no tubercles. The pericardial sac contained an excess of clear yellow fluid, and under the epicardium were two or three very small pustules like large tubercles, which in smears and culture proved to contain staphylococcus aureus. The temperature varied between 99° and 105° F. Was this fulminant staphylococcal meningitis? Maiella[13] in experimental staphylococcal meningitis, in dogs, found that pus formation did not occur if death occurred early—within three days. Ballance[49] found this absence of pus formation in fulminant otitic meningitis (meningitis serosa maligna); and several observers also in cases of fulminant cerebro-spinal (epidemic) meningitis.

Of 6 cases not definitely diagnosed, 3 have been described under tuberculous (M. M.), pneumococcal (C. J.), and staphylococcal (F. T.) meningitis.

In R. M., dying a few hours after admission, lumbar puncture was not performed. Necropsy showed meningeal congestion and turbid effusion, no pus. It was probably septicæmia connected with a healed sore on the foot; resembling a case seen in the Edinburgh Royal Infirmary, where a Swedish sailor, dying a few hours after admission, showed nothing definite at the necropsy, but staphylococcus was obtained in culture from the blood contained in the heart and from the spleen, a small septic focus in the axilla having healed a few days before onset of symptoms.

Another case, C. McC., aged 5 years, died 15 hours after admission with persistent fits, which originated a few hours before admission with a typical epileptic fit. Lumbar puncture had no effect, giving a slightly increased fluid with small lymphocytosis. Post mortem there was no evident congestion, the brain seeming unusually dry. The ears were healthy. This appears to have been status epilepticus. Richenel and Castin[50] have reported a case in which repeated lumbar puncture produced temporary relief.

R. T., under treatment for infantile eczema, suddenly developed severe convulsions and retraction which lumbar puncture temporarily relieved, giving an excess of watery fluid, slightly blood-stained and with a slight increase in lymphocytes. The convulsions recurring soon after proved fatal, the temperature rising to 106° F. Necropsy revealed cerebral congestion and extravasation of blood into the membranes, which may have explained the blood-cells in the spinal fluid; also a much enlarged thymus. Feer,[51] who has collected over 30 cases of "eczema deaths," attributes them to status lymphaticus, which the state of the thymus in this case appears to confirm.

Several cases of meningitis were brought to hospital for the fits, and in the absence of other meningitic symptoms were sometimes sent away as epileptic or teething. This is probably not a rare occurrence, since in the Reports of a large London hospital two cases are mentioned as having been admitted for fits and discharged cured, one of which, re-admitted later, died from tuberculous meningitis, the other dying four days later in another hospital, also from tuberculous meningitis. Several cases were also mentioned as dying with fits which necropsy failed to explain.

Acute Serous Meningitis.

This series included one case apparently of acute serous meningitis.

The patient was a girl aged 1 year and 8 months. Acute meningitic symptoms, with definite optic neuritis and persistent screaming fits, were present; also the marked craving for food seen in some cerebral cases. Marked improvement followed lumbar puncture. The fluid on two occasions spurted for a considerable time, being in large excess, but otherwise normal, being devoid of cells and sterile in culture. The screaming fits and the voracious appetite persisted for a while after leaving hospital. After 2½ months lumbar puncture was again performed. The fluid again spurted, being otherwise normal. She was then a different child—bright, happy, and apparently quite well. The optic discs appeared normal, the screaming fits had practically ceased.

Acute Poliomyelitis.

Lumbar puncture in 4 cases of acute poliomyelitis gave a fluid with certain similar characters. It was increased with a small blood contamination. In 2 there was a small but definite lymphocytosis and in the other 2 the lymphocytes were increased. They all reduced Fehling's solution, but slowly. Albumin was not appreciably increased, but seemed slightly so in 2. In 1 the fluid actually spurted in the third week of the disease, and gave a culture of a Gram-negative irregularly staining bacillus. In another lumbar puncture on four occasions was similar, being more plentiful at the last tapping, three weeks after the first, and was sterile in culture. This case on admission was regarded as tuberculous meningitis, with cervical rigidity, hemiplegia, and lymphocytosis, but no tubercle bacilli were found nor the typical coagulum. Another case was very retracted and "meningitic" in the out-patient room. The largest lymphocytosis occurred in a case with no cerebral symptoms. No organisms were seen in smears. Ager[52] avers that lumbar puncture is highly beneficial and that the improvement in the later stages has been so often accelerated by it that further trial is justifiable. In the case in which the fluid spurted it was thought there was some improvement after its removal.

In diagnosis lumbar puncture is of very great importance, the one conclusive result being the identification of a causal organism. With most of the tests a negative result may be of little consequence, while positive results are of value, as they confirm one another and the clinical evidence. Therapeutically lumbar puncture has been disappointing, partly because too much was expected from it. Cures have been attributed to its repeated performance in various forms of meningitis, even tuberculous, with or without other treatment. In microbial meningitis it may do good by removing organisms and their toxins, and by removing an inert fluid with practically little or no opsonic and agglutinative properties and thereby causing the exudation of fresh fluid having greater protective powers.[34] A vaccine may be prepared from the fluid or antiseptic injection employed. There is, however, the fact that many cases are too *foudroyant* to allow of opportunity for treatment, while others are so latent as to escape suspicion of the real nature of the condition until past interference. Meningitis associated with otitis often best lends itself to operative interference. The septic focus having been removed and the meninges drained, a cure has several times resulted. Encouraging results are reported as following the administration of urotropine[53] in meningeal infection. The drug is said to be excreted in the spinal fluid in half to one hour after ingestion and to exert a marked antibacterial effect. It was first employed in a case of cerebro-spinal fistula, following trephining for cerebral tumour, in which the discharge became purulent. After the administration of 30 grains daily for a week the temperature became normal and recovery ensued. Experiments made in animals confirmed its value, and its prompt administration in all cases where meningitis is a possible complication is advised.

I am much indebted to the staff of the Queen's Hospital for Children for permission to publish this account of cases which were in their wards.

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Carshalton.

TWO NOTES ON STERILISATION OF THE SKIN BY THE USE OF AN ALCOHOLIC SOLUTION OF IODINE.

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AND

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Note by H. F. WATERHOUSE.

FOR several years I have employed iodine as an antiseptic for the sterilisation of catgut, and have found that soaking the catgut, as it comes direct from the manufacturer, in a solution of 1 part of iodine to 500 of equal parts of rectified spirit and water for a period of one week has invariably proved sufficient to render the catgut sterile, and thus safe for surgical purposes.

I have on several occasions in years past attempted to make use of the tincture of iodine as an adjuvant to the sterilisation of the skin after a preliminary careful and thorough washing and scrubbing with soap and water, and the employment of an antiseptic solution. To my disappointment the results were not superior to those obtained by the ordinary methods, and I had begun to fear that for some reason iodine in solution was unsuitable for sterilisation of the skin. It was not until my attention was drawn to the fact that this method failed for the reason that the water used in cleansing the skin caused the epithelial cells to swell and thus prevented the antiseptic from penetrating deeply between them and into the ducts of the sebaceous and sweat glands that I realised that the preliminary washing with soap and water was not only unnecessary but even harmful.

Since abandoning the use of soap and water and contenting myself with painting the skin with an alcoholic solution of iodine my results have been nearer perfection as regards the absence of sepsis than any I have previously obtained. I have myself made use of the method in 150 cases, with the result that 149 healed entirely by first intention. In one case only was there any sepsis, and even in this instance (a radical cure of inguinal hernia) when the sutures were removed on the eighth day the wound was healed except in its outer three-quarters of an inch, where its margins gaped slightly. At the next dressing three days later a small quantity of pus was found, which on bacteriological examination, gave a pure culture of staphylococcus albus. This slight suppuration soon ceased and the patient was discharged at the end of three weeks with the incision soundly healed. Of the 150 cases, 110 occurred in my wards at Charing Cross Hospital; they were all under the daily observation of Mr. W. S. Fenwick, who has been kind enough, at my request, to add a note concerning them to this communication. Of the remaining cases, 22 were in my ward at the Victoria Hospital for Children, and for information regarding them I am indebted to the house surgeon, Dr. J. B. Molony. 18 occurred in my private operative practice. I would desire to express my obligations to Miss Enid Stockdale, the sister in charge of my wards at Charing Cross Hospital, and to my house surgeons, Dr. E. H. Hugo, Mr. Norman G. H. Salmon, and Dr. R. H. H. Jolly, for much help willingly rendered in this investigation. Of the above patients, death occurred in one only—viz., in the case of a woman, aged 50 years, sent to me by my colleague, Dr. Victor Corbould, with advancing thrombo-phlebitis of the left internal saphena vein. After the incision requisite for the removal of the inflamed vein had healed, the patient was on the afternoon of the day of her death seen by Dr. Corbould and myself in the ward. She stated that she felt quite well and almost able to get out of bed. At 8 P.M. she died suddenly after four or five minutes of intense dyspnœa. A confident diagnosis of pulmonary embolism was made, but a careful necropsy by Dr. D. Forsyth failed to reveal an embolus. It showed, however, what we had never suspected—an advanced stage of contracted granular kidneys. It is worthy of note that on examination prior to operation no albumin was found in the urine, but it must be admitted the urea had not been estimated. The mode of death in this case with intense and sudden dyspnœa remains to me a mystery.

For the first 26 cases a solution of in some cases 8 and in others 6 per cent. of iodine in rectified spirit was employed. It was painted on the skin of the operation area two hours prior to bringing the patient into the theatre. As soon as the skin had dried it was covered by a sterilised towel, which was bandaged on. Whilst the anæsthetic was being administered a second application of the 8 or 6 per cent. solution was made, and the operation was commenced two or three minutes later. It soon became apparent that these solutions were unnecessarily strong. Three patients complained that the smarting pain was severe after the first application. In all three the skin of the neck was the area involved. The solution was, so the theatre sister informed me, very destructive to the towels, burning holes in them. I therefore determined to employ a weaker solution and decided upon 2 per cent. of iodine in rectified spirit. This has proved entirely satisfactory and has given risen to no single complaint of smarting. For the first 25 cases in which the weaker solution was used I thought it well to employ three applications of the iodine paint in place of two of the stronger fluid. The first application was made two hours, the second one hour prior to operation, and the third on the operating table.

Recently we have omitted the intermediate painting. The 2 per cent. solution appears to me to be just as trustworthy as the 6 per cent., and it has not caused any complaint of smarting or got me into trouble through the destruction of towels in the operating theatre.

It is worthy of note that the staining caused by the iodine solutions is at once removed by soaking the towel in a solution of carbolic acid (2½ per cent.).

A matter of real importance is that the iodine should be dissolved in rectified, not in methylated, spirit. This I learned at the expense of considerable suffering to my assistants as well

as to myself. When first we employed the 2 per cent. solution it was ordered to be dissolved in rectified spirit. Someone well aware that it was used for external application only, in the interests of economy employed methylated spirit without informing me of the change. To my astonishment the weaker solution proved painfully irritating to the conjunctiva, even some minutes after its application. The suffering and lacrymation were so intense that I had contemplated abandoning the method when I learned of the substitution of methylated for rectified spirit, and insisted on the employment of the latter, since which the trouble has entirely disappeared.

On a few occasions tincture of iodine was employed. This, as also a 2 per cent. solution of iodine in chloroform, gave results quite similar to the 2 per cent. alcoholic solution.

In future I shall always employ a 2 per cent. solution of iodine in rectified spirit. I shall paint this solution on the skin two hours prior to the operation, the preliminary shaving and any necessary washing of the skin having been performed some time earlier in order to allow the skin to dry. I shall then for greater security in important cases repeat the painting one hour later, though I hardly deem this intermediate application necessary. The last painting will be done on the operating table. A small flat painter's brush answers admirably. It need only be sterilised if the surgeon is to handle it on the operating table. In general, a dresser or a nurse will do the painting while the surgeon is washing his hands.

In radical operations for hernia in small boys it is always difficult to keep the penis under cover, and in such cases I invariably paint the whole organ and scrotum with the 2 per cent. iodine solution and leave them uncovered with a full sense of security.

It must be admitted that the iodine solution increases the vascularity of the skin and subcutaneous tissues and that the superficial hæmorrhage is greater than normal. Further, it seems certain that the edge of the knife becomes dulled sooner than is generally the case, and the skin appears distinctly hardened. Dr. Molony considers that in young children collodion applied to the incision after suture is apt to cause redness of the skin and irritation, and I am inclined to agree with him that its use is inadvisable.

My house surgeons, who have used this method in a large number of cases in the out-patient and casualty departments, are in general agreement that whilst the results obtained by them have been very satisfactory they have not been equal to those found in the case of in-patients. The reason doubtless is that in the hurry of out-patient minor operations a sufficient time may not intervene between the two applications of the iodine solution; thus it may be reduced from two hours to 10 or 15 minutes. A case typical of the value of the method in out-patient practice may be mentioned.

A labouring man with more than ordinarily dirty feet had a painful hammer-toe on each foot. My house surgeon painted the parts with the iodine solution without the use of soap and water and repeated the application half an hour later. The offending toe of each foot was amputated in the out-patient operating room and the wounds dressed. The patient returned a few days later with both incisions healed by first intention. This case well exemplifies the time-saving value of the method.

In certain cases in which it appeared probable that the skin incision might be infected by discharge from a hollow viscus—e.g., colotomy and cholecystostomy—it was found advisable to paint the line of incision with the 2 per cent. iodine solution each time the wound was dressed. The incision was then covered by dry cyanide gauze. Though this frequent painting might be carried out twice daily for from 4 to 6 days no interference with the healing of the incision was noted. This method I can cordially recommend.

A notable advantage of the iodine method is the fact that the whole preparation is carried out only two hours prior to the operation. One of my private nurses informs me that in her experience a patient prepared for an amputation of the breast the evening prior to operation hardly obtains any sleep. The scrubbing of the skin, the employment of the necessarily irritating antiseptic, and the bandaging are jointly responsible for this, and the dressing is a constant reminder of what is to come in the morning. With the iodine method the patient's preparation only begins in the morning and she therefore has nothing but the dread of the operation to interfere with sleep.

In conclusion, I may add that I am so satisfied with the iodine method that I intend to use it in future as a routine measure and will continue to do so until a better is discovered.

Note by W. STEPHEN FENWICK.

In adding a list of the 110 cases which occurred in Charing Cross Hospital I am able to endorse most emphatically all that has already been said by Mr. Waterhouse both as regards the simplicity and the efficacy of the iodine method of skin preparation. From the point of view of the dresser it is a boon, owing to the great saving of time; moreover, the patient is spared the worry and tedium—to make no mention of actual pain—that the ordinary method entails.

It is worthy to note that a few of the cases recorded below were more or less septic at the time of operation—e.g., excision of a rodent ulcer and excision of a strawberry tumour of the umbilicus with a markedly eczematous condition of the surrounding skin—yet healing *per primam* occurred.

All are aware of the difficulty in sterilising the skin immediately adjacent to a septic focus; the iodine method would appear to overcome this difficulty.

On examining the wounds at the eighth day I was struck by the entire absence of moisture around the stitches in the skin. In cases prepared by the ordinary method it is quite common, even where there is no other evidence of infection, to find, when stitches are removed at the end of a week, a minute bead of pus (usually giving a culture of staphylococcus albus) at one or more of the stitch openings.

The cases were as follows:—

Herniotomy (femoral and inguinal)	22 cases.
Appendicectomy	16 ,,
Excision of glands in neck and axilla	9 ,,
Excision of varicose veins	8 ,,
Amputation of breast and excision of breast adenomata	6 ,,
Gastro-enterostomy	5 ,,
Cholecystostomy	4 ,,
Partial thyroidectomy and enucleation of thyroid adenomata	4 ,,
Radical cure of hydrocele	3 ,,
Excision of lipomata	3 ,,
Amputations (leg and fingers)	2 ,,
Colotomy	2 ,,
Excision of hip-joint	2 ,,

And one each of the following: hysterectomy, nephrolithotomy, laparotomy, radical cure of congenital umbilical hernia, excision of sarcoma in axilla, wiring fractured olecranon, wiring fractured patella, excision of rodent ulcer, excision of shoulder-joint, suture of median nerve, orchidopexy, excision of strawberry tumour of umbilicus, excision of branchial cyst, suture of tendons, castration, evacuation of psoas abscess, ovariotomy, and excisions of sarcoma of thigh, of needle in hand, of sebaceous cyst, of fibroma, of thyroglossal cyst, of phalanges, and of nævus.

Comparing the iodine method with that still in common use, I am convinced that the former is more easily carried out, takes less time, is less unpleasant to the patient, and gives better results than the latter.

CHELSEA HOSPITAL FOR WOMEN.—In the thirty-ninth annual report of the council of this institution, which was submitted to the recent annual meeting of the governors, it is shown that the outstanding features of the past year's work have been a considerable increase in the number of the in-patients (801 as compared with 720 for 1908) and a deficiency of income of £1000. The chairman, in moving the adoption of the report, stated that although the expenditure on medical requirements, and especially on appliances for sterilisation, had been increasing, economy in other directions had reduced the average weekly cost per patient from £2 6*s.* 2*d.* of 1908 to £2 0*s.* 11*d.* The deficiency of £1000 was largely due to absence of legacies; the annual subscriptions owing to the death of old friends had also fallen off. Fortunately, he said, the hospital would shortly receive from the trustees of the Zunz Bequest a sum of £2000, and hoped that this generous recognition of the hospital's work, like the recent munificent donation by Lady Tate of £1000 to endow a bed, would encourage other benefactors to come forward. The chairman also alluded to the fact that 113 hysterectomies for the removal of fibroid tumours had been made during the year without a death. Contributions should be sent to the treasurer, Mr. H. E. Wright, or to the secretary, Mr. H. H. Jennings, at the Hospital, Fulham-road, S.W.

A CASE OF

EMBOLISM OF THE ABDOMINAL AORTA WITH MITRAL STENOSIS AND THROMBOSIS OF THE PULMONARY VEINS; DEATH; NECROPSY.

BY SIDNEY P. PHILLIPS, M.D. LOND., F.R.C.P. LOND.,
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THE patient, aged 39 years, began to be troubled by a feeling of shortness of breath in January, 1909; after attending as an out-patient till the following November this increased and he had to give up work and lie up at home for five weeks. He then came under my care at St. Mary's Hospital on Jan. 10th, 1910. There was no history of rheumatism, or of syphilis, or of any illness. The patient was a strongly-built, fairly nourished man and the only complaint he made was of shortness of breath, even while he was lying quietly in bed and the respirations were only 20 per minute. There was slight cyanosis. I could find no defect in the lungs. His pulse, about 70 a minute, was feeble and at times irregular; over the apex beat of the heart, which was situate just outside the left nipple line, the first sound was short and sharp, and the second sound was usually duplicated, but a series of beats often occurred in which it was not duplicated and at other times a series of beats in which no second sound was audible. A presystolic rumble was present, but I never felt any thrill. There was no dropsy and no evidence of tricuspid regurgitation. On the 12th he had sudden severe pain in the lower part of the abdomen, persisting throughout the night, with vomiting of all food taken, and in the early morning of the 13th there was pain in the left leg. These pains had passed away when I saw him later on the same morning; the skin over the abdomen generally was very hyperæsthetic, but there was no distension or rigidity of the abdomen. On the same afternoon sudden pain occurred in the loins and the urine passed soon after contained a slight cloud of albumin which had up to that time been absent. There was no hæmaturia. The temperature rose in the evening from normal to 100·8° F. During the next few days the patient was free from pain and seemed much better, the pulse was 48 to 60 a minute, the presystolic murmur was more definite, a trace of albuminuria persisted. On the 24th sudden intense pain came on in both legs below the knees and they became cold and blanched; there was another attack of intense pain in the abdomen and the patient became pinched in the face and looked very ill. The pain in the legs continued severe, and there was a complete loss of sensation to touch and to pin-pricks below the knees, but no evident loss of motor power. The skin of the legs and feet became cold and clammy with hard patches of venous stasis. There was very faint pulsation in the dorsalis pedis artery and the posterior tibial arteries, but the femorals could be felt to pulsate below Poupart's ligaments. The abdomen became very distended, tense, and tender. The temperature, normal or subnormal since the 16th, fell to 96° or 97°. There was little alteration in the heart signs except extreme feebleness of the right ventricle sound. Death occurred on the 25th.

Post-mortem examination by Dr. B. H. SPILSBURY.—The mitral orifice barely admitted the tip of the little finger and was slit-like in character. The cusps were thickened and fused together with some calcification. No recent endocarditis was present. The left ventricle was slightly dilated. The tricuspid orifice admitted the tips of three fingers. The wall of the right ventricle was much hypertrophied. The aorta was normal, but at its bifurcation was a mass of dark-red blood-clot which completely blocked the orifices of the common iliac arteries and extended along them and the external iliac and femoral arteries as far as the origin of the profunda arteries on both sides. The blood-clot occupying these vessels was everywhere dark and friable; it was slightly adherent to the vessel walls above but not at all below. Both lungs showed some hypostatic congestion, but there were no infarcts in them or inflammatory consolidation. In both kidneys and in the spleen were several recent large hæmorrhagic infarcts; some of these in the kidney had a dull white uniform colour with an hæmorrhagic border, others were of a dull terra-cotta colour. The lower part of the small intestine showed areas of greenish discolouration of the wall, due, it was found, to a long, firm, dark blood-clot in one of the branches of the superior mesenteric artery; it filled the vessel above and had a conical termination below; the last two feet of the small intestine were normal.

Subsequent dissection and microscopic examination showed in the tributaries of the pulmonary vein in the right lung numerous small yellow areas of degeneration of their inner surfaces; some of these veins contained small masses of dark and firm clot. Microscopically some of these tributaries showed fibrous thickening of the tunica intima; some were completely filled with pale thrombus which was adherent to the walls and which was undergoing organisation, and in these areas the walls of the veins were extensively vascularised. The thrombi were in places invaded by organisms. There was no inflammatory change in the surrounding lung tissue.

Remarks.—The association between mitral stenosis and occlusion of the abdominal aorta is well recognised; thus of 54 cases of aortic occlusion verified by post-mortem examination, of which Dr. W. H. Welsh collected the records,[1] 34 per cent. were in patients who had mitral stenosis. In some of these cases there was no difficulty in attributing the occlusion of the aorta to embolism, there being present recent or ulcerative endocarditis or clots within the heart cavities, from which emboli could have originated. But in the great majority of the cases there were no such lesions and no source from which an embolism could have started was detectable, and it remained doubtful whether the occlusion of the aorta arose from embolism or from thrombosis. This was so in the present case, and until Dr. Spilsbury's careful examination and dissection revealed the changes above described in the pulmonary veins.

The symptoms during life and the blocking of many arteries found at the post-mortem examination in the present case pointed strongly to the occlusion of the aorta being due to embolism and not to thrombosis, though probably secondary thrombosis took part in making the occlusion complete. And presumably the emboli arose from the clots found in the pulmonary veins. Very possibly this was the case in some of the other recorded cases of mitral stenosis and aortic occlusion in which no source for embolism was found, but in which the condition of the pulmonary veins was not investigated or recorded, for, as Dr. Welsh observes, the reports of many of them are imperfect or defective.

Among the points of interest in this case are the following. 1. The changes in the pulmonary veins. It has been pointed out by Sir James Barr that it is especially in cases of mitral stenosis that atheroma and thickening of the pulmonary veins arise. Such changes occurred in this case with formation of clots in the smaller pulmonary veins, and it is especially in cases of mitral stenosis such as this, occurring in a strong healthy man in whom tricuspid regurgitation was staved off by very considerable hypertrophy of the right ventricle, that the pressure in the pulmonary veins must be much increased and that changes in the walls of the pulmonary veins might be most expected. 2. The symptoms of the mitral stenosis. There was no discomfort about the heart region and much less irregularity and disturbance of its action than occurs in many cases of mitral stenosis, and there was no evidence either during life or after death of tricuspid regurgitation or of any affection of the lungs. Nevertheless, throughout the whole year of his illness, the one symptom of which the patient complained and which made him give up work, was a sense of shortness of breath, and this persisted while he was at rest and without any increase in the number of his respirations. It seems probable that this shortness of breath was due, in part at any rate, to the changes going on in, and to the thrombosis in, the pulmonary veins. 3. The symptoms arising from embolism of the aorta. As in other recorded cases, there were sudden attacks of intense acute pain in the abdomen and in the limbs, with changes in the latter indicative of impeded arterial blood-flow. That gangrene did not occur was only because the patient died so soon. It was noticeable that though there was complete

[1] Allbutt and Rolleston's System of Medicine, vol. vi., p. 273. first edition.

anæsthesia in the lower limbs with intense pain there was not, as in some recorded cases, any loss of motor power. Although there were many emboli in the kidney, there was no hæmaturia and but a slight cloud of albumin in the urine, and though the intestine supplied by the blocked mesenteric artery was tending towards gangrene no melæna occurred.

Upper Brook-street, W.

A CASE OF BILE-PRODUCING PRIMARY MALIGNANT TUMOUR OF THE LIVER ("MALIGNANT ADENOMA"),

WITH REMARKS ON THE CELLS OF MALIGNANT TUMOURS RETAINING SOME OF THE METABOLIC OR OTHER FUNCTIONAL CHARACTERISTICS OF THE CELL TYPE FROM WHICH THEY ARE DERIVED.[1]

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THE patient, a man, aged 69 years, was admitted into the German Hospital on Jan. 27th, 1910. He said that he had enjoyed good health and gave no history of previous illnesses of importance. But since the summer of 1909 he had suffered from increasing debility with loss of flesh. He did not, however, consult a medical man until six weeks before admission, when he complained of pain and swelling in the abdomen. In the hospital the patient was found to have ascites; the liver could be felt enlarged and hard, its surface somewhat uneven, and its lower edge reaching to the umbilical level. The spleen could not be distinctly palpated but the splenic dulness was enlarged. The patient's temperature was slightly above the normal but never as high as 100° F. The pulse was about 80 to 90 per minute. Although there was no obvious jaundice in the skin or conjunctivæ a trace of bilirubin was detected in the urine, which likewise contained a little albumin. The patient died on Feb. 3rd, 1910.

FIG. 1.

Photomicrograph (× 97) of the border of one of the tumour nodules in the liver. The new growth is on the right, the liver tissue on the left.

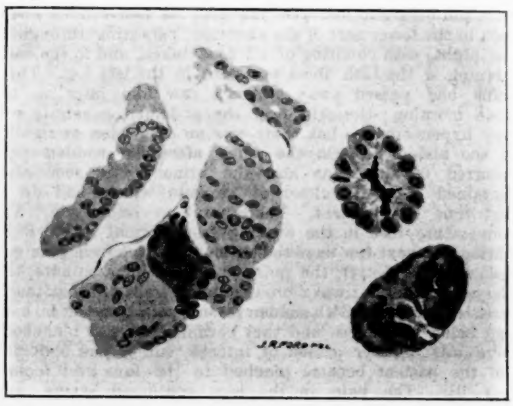
Necropsy.—At the post-mortem examination the peritoneal cavity was found to contain much ascitic fluid mixed with blood, intraperitoneal hæmorrhage having evidently taken place from a vein passing over a large mass of new growth in the right lobe of the liver.

The liver (weight 89 ounces) was much enlarged and had an uneven surface owing to the bulging caused by the presence of multiple tumours. There was no perihepatitis. The gall-bladder and extra-hepatic bile-ducts were free. The extra-hepatic blood-vessels were not thrombosed. On section the organ was seen to be moderately cirrhotic, but to consist chiefly of rounded nodules or masses of new growth, varying from the size of a pea to double the size of a medium apple. The largest mass, in the right lobe, might possibly have been the primary growth. The tumours were almost entirely necrotic, having been transformed into a pulpy substance ("*purée cancéreuse*"), coloured greenish or yellow by the bile. In fact, nearly the whole of the liver substance was replaced by these pultaceous masses, somewhat of the consistence of mashed potato. It is quite possible that some of the pultaceous masses included necrotic liver tissue as well as necrotic new growth. The original cirrhotic liver substance was still fairly well preserved at the margin of the left lobe. In addition to the appearances already described there were a few hæmorrhages.

The spleen (weight 15 ounces) was enlarged and enclosed in a greatly thickened capsule, evidently the result of old perisplenitis; in fact, the spleen might be termed a "Zuckergussmilz," just as the German term "Zuckergussleber" has been applied to livers the capsules of which are greatly thickened from old perihepatitis.

After a careful examination no evidence of new growth could be found elsewhere than in the liver, with the exception of a single cherry-sized tumour nodule (evidently metastatic) in the left lung. Macroscopic and microscopic examination of the rectum showed the presence of hæmorrhoids, but not of any new growth. The prostate gland was likewise examined macroscopically and microscopically for evidence of new growth, but with negative result. The heart (weight 8½ ounces) was hypoplastic, and the pericardial surfaces were adherent from old pericarditis. There were pleuritic adhesions on both sides of the chest. The kidneys (weight of both together 9 ounces) showed a little old interstitial fibrosis and a condition of cloudy swelling. Nothing of special interest was discovered in the pancreas, adrenals, stomach, or rest of the alimentary canal. The lymphatic glands (microscopic examination) were apparently not infiltrated with new growth. I have to thank my house physician, Dr. G. Dorner, for his great help in the examination of the case.

FIG. 2.



Tubular columns of tumour cells enclosing inspissated bile. From the same section as Fig. 1, but under higher magnification.

Microscopic examination of the liver.—The minute non-necrosed nodules of new growth (Fig. 1) consist of cells more or less resembling those of the hepatic parenchyma and showing a marked "trabecular" arrangement (the "*épithéliome trabéculaire*" of Hanot and Gilbert[2]), that is to say, they form tubular columns of cells more or less imitating the columnar arrangement of the liver cells in the normal hepatic acini. The columns in the new growth are, however, much thicker than the normal columns of liver cells, and are more irregular in their arrangement, and the tumour cells stain slightly more deeply (hæmatoxylin and eosin) than the normal liver cells. Some of the tubules contain inspissated bile (Fig. 2), which is coloured dark green in the sections stained by hæmatoxylin. In some parts the columns

[1] A paper read before the Pathological Section of the Royal Society of Medicine on March 15th, 1910.

[2] V. Hanot and A. Gilbert: Études sur les Maladies du Foie—Cancer, &c., Paris, 1888, p. 41.

of cells in the new growth are separated from each other by considerable spaces containing connective-tissue shreds. These "intertubular" spaces were doubtless orignally much smaller and were occupied by imperfectly formed blood-vessels, but have become enlarged during the process of preparation of the sections. Some portions of the new growth (probably on the point of becoming necrotic) show hæmorrhagic and small-cell infiltration.

The tumour capsules, if any can be said to exist, are formed by the compressed surrounding tissue. The liver substance shows small-cell infiltration, chiefly of interacinous distribution, and a moderate degree of cirrhosis; there are likewise scattered hæmorrhagic areas.

Remarks.

The case is doubtless one of a form of primary carcinoma of the liver in which the tumour cells are derived from the glandular bile-secreting cells of the hepatic parenchyma. After a careful search (partly microscopical) no primary growth could be discovered in the stomach, rectum, intestines, prostate, &c.[3] The primary hepatic nature of the growth is, moreover, abundantly confirmed by the appearance of the tumour cells and by their ("trabecular") arrangement in tubules, some of which enclose inspissated bile. The malignant nature of the tumours is proved not only by their great development in the liver and by the necrotic changes they have undergone there, doubtless due to involvement of the hepatic blood-vessels, but also by the presence of a secondary nodule in the lung, which, however, I regret was unfortunately not examined microscopically.

The disease in question has been variously termed "primary carcinoma with cirrhosis" (Hanot and Gilbert), "cirrhosis maligna," or, as Dr. H. D. Rolleston (on the analogy of carcinoma of the stomach supervening on chronic gastric ulcer and primary carcinoma of the breast supervening on chronic interstitial mastitis) prefers to call it, "cirrhosis carcinomatosa." The tumour has also been spoken of as "hepato-adenoma" (Lancereaux), "adeno-carcinoma of the liver," and "malignant adenoma of the liver" (H. Ribbert). By analogy with terms which have been suggested or employed to designate primary tumours of other organs (e.g., "hypernephroma," and possibly also "myeloma" and "splenoma") the term "hepatoma"[4] or "malignant hepatoma" might also be adopted for these primary carcinomata of the liver. If, however, this principle of nomenclature were to be carried further the text-books would soon be containing descriptions of "mastoma," "nephroma," "pancreatoma," and possibly also of various forms of "gastroma" and "enteroma."

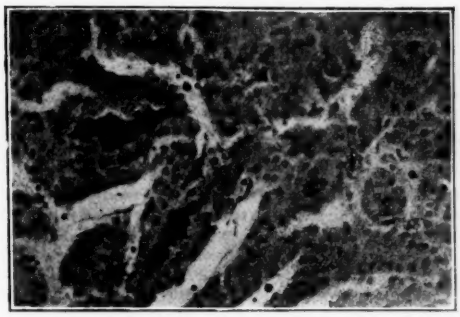
Do the cells of malignant tumours retain some of the metabolic or other functional characteristics of the type of cell from which they are derived? In the present case the tumour-cells were certainly secreting bile (or at all events bile-pigment) in some parts, as shown by the inspissated secretion enclosed within many of the tubular columns of the growth. It is quite possible that a stage of simple adenoma or "nodular hypertrophy" of liver cells precedes the development of the malignant adenoma (primary carcinoma) of the liver cells, and it might perhaps be objected that bile is only secreted by the cells during the "nodular hypertrophy stage," but that when the stage of malignancy is reached the tumour-cells are no longer bile-producing. It is quite likely, indeed, that the power of secreting bile gradually diminishes when the tumour becomes malignant, and in this connexion I am exceedingly sorry that the metastatic tumour in the lung of the present case was lost. However, Dr. Rolleston[5] figures a section, which he has kindly allowed me to copy (Fig. 3), from a case of hepatic "carcinoma with cirrhosis" in which the tubules of the growth contain still more inspissated bile than in the present case, and H. Ribbert,[6] in a recent article on "malignant adenoma" of the liver, refers to bile production by the tumour cells as a pathological distinction of great importance for the recognition of this class of new growths.

In this connexion one may call to mind that some of the primary tumours of the bone-marrow termed "multiple myeloma" (whose malignancy is evidenced by the bone-erosion which they cause, and occasionally by involvement of lymphatic glands) have been found to consist of cells whose cytoplasm contains granules more or less resembling those in normal myelocytes.[7] From the same point of view it is likewise interesting that certain tumours of the hypernephroma type in children have apparently given rise to a precocious plethoric type of obesity (or to excessive growth of the skeletal muscles) and premature sexual development.[8] I need scarcely refer to the well-known (though rare) metastatic tumours (in bones, &c.) of typical thyroid structure. One may furthermore instance the well-known production of "cell-nests" ("epithelial pearls") in some of the metastases from squamous cell carcinomata of the skin and tongue as well as in the primary growth.

Perhaps improved methods of chemical and physiological histology will ultimately show that the cells of certain primary malignant tumours of the breast, pancreas, and other organs do retain some of the functional characteristics of the cells of the organ from which they are derived.

Harley-street, W.

FIG. 3.



Photomicrograph (× 220) from a case of hepatic "carcinoma with cirrhosis" illustrated by Dr. Rolleston.

[3] In all apparently primary cancers of the liver the importance of careful search for a possible primary growth elsewhere is well known. In regard to examination of the rectum it is also a recognised fact that small tumours of the rectum may give rise to large secondary growths in the liver. Thus, in 1904 a man (aged 50 years) under my care died from secondary carcinoma of the liver. The organ in question was of immense size and weighed 12½ kilogrammes—that is to say, over one-fifth of the total weight of the body (60½ kilogrammes)—whereas the primary growth in the rectum formed a projecting lump of the size only of a large cherry.

[4] Vide L. Renon, E. Gérandel, and R. Monnier-Vinard, "L'Hépatome—Tumeur Primitive du Foie," Presse Médicale, Paris, Jan. 12th, 1910, p. 29.

[5] Rolleston: Diseases of the Liver, 1905, p. 477.

[6] Ribbert: Deutsche Medicinische Wochenschrift, 1909, Band xxxv., p. 1607.

[7] Cases of F. P. Weber (1903), Sternberg (1903), Charles and Sanguinetti (1907), A. Herz (1908), and Umber (1908). The references to the literature on these cases are given by Weber and Ledingham, Proceedings of the Royal Society of Medicine (Pathological Section), 1909, vol. ii., p. 206.

[8] See Bulloch and Sequeira, Transactions of the Pathological Society of London, 1905, vol. lvi., p. 189; and Guthrie and Emery, Transactions of the Clinical Society of London, 1907, vol. xl., p. 175.

MUNICIPAL TECHNICAL COLLEGE, BRIGHTON.—A new departure in the work of the Brighton Technical College was made on the evening of April 5th, when Dr. F. G. Bushnell commenced a course of lectures on bacteriology. The course is primarily intended for students of public health, but has been arranged so as to be also a suitable adjunct to the study of dental surgery, veterinary medicine, agriculture, and pharmacy. The course is illustrated with lantern slides and demonstrations.

THE METROPOLITAN PUBLIC GARDENS ASSOCIATION.—This association, formed in the year 1882 with the object of providing breathing spaces and resting places for the old and playgrounds for the young in the midst of densely populated localities, shows in its twenty-seventh annual report a record of work which must play an important part in conserving the health of the inhabitants of the metropolis. Not the least useful work of the association is the careful watch which it keeps over measures introduced into Parliament and its active opposition to Bills containing clauses which endanger existing open spaces. During the past year in connexion with kindred bodies it secured a clause in the Town Planning Bill for the protection of commons and open spaces. The association is under the patronage of His Majesty the King and the Prince of Wales. To the report is added an appeal by the chairman, the Earl of Meath, for additional financial support.

A CASE OF EPIDEMIC CEREBRO-SPINAL MENINGITIS, TREATED BY FLEXNER AND JOBLING'S SERUM; RECOVERY.[1]

BY JOHN J. WEAVER, M.R.C.S. ENG., D.P.H. CANTAB.,
MEDICAL OFFICER OF HEALTH, SOUTHPORT.

With notes by N. PERCY MARSH, M.B. Lond., *Physician to the Liverpool Infirmary for Children.*

A GIRL, 16 years of age, was admitted into the Southport Infectious Diseases Hospital on Friday, Nov. 26th, 1909. On Friday, Nov. 19th, seven days before admission, she was at school and well. On the following evening (Saturday) she complained of slight headache, which, however, soon passed off. On Sunday she ate a good dinner. When in church at night she was suddenly attacked with pain at the back of her neck and in her legs. On returning home she is said to have had a rigor, followed by a restless night. On Monday, the 22nd, she had headache, pains all over her body, vomiting, and rigor, followed again by a restless night. On Tuesday the headache and vomiting continued, and there was slight sore-throat. Slight stiffness of the neck was noticed. The temperature was 103° F. There was no sleep at night. On Wednesday the stiffness of the neck was more marked. Vomiting had ceased. Temperature 103°. Very restless; no sleep. On Thursday, the day before admission to hospital, her neck was rigid. The temperature was 103°. There was retention of urine and a catheter was passed. The restlessness continued: no sleep.

On Friday I was asked to see the patient at her own home in consultation with her own medical man with a view to the case being removed to hospital as possibly a case of typhoid fever. At that time the symptoms pointing to typhoid fever were the headache, the furred tongue, the continued rise of temperature, some doubtful "spots" on the abdomen, and an indefinite history of general ill-health for some few weeks before the actual onset of the present illness. There was, however, no diarrhœa, no enlargement of spleen could be detected, and the aspect of the patient, including the slight retraction of head, which, however, at this time was not very marked, was not quite that of typhoid fever. However, as the patient could not be satisfactorily nursed at home, I agreed to her removal to hospital.

On admission at the hospital the same day (Nov. 26th) the patient had dull aching, but not very acute, pain in the head. She was drowsy and apathetic, but answered intelligently any questions put to her. The tongue was furred. The retraction of the head prevented her lying on her back, and the muscles of the back of the neck were very tender to touch. The temperature was 101°. The bowels were constipated. Widal's reaction was negative. Up to this point, beyond the doubt about the case being one of typhoid fever, a definite diagnosis had not been made. On the chance of the pain in the muscles of the neck being of a rheumatic character a few doses of salicylate of soda and bicarbonate of potash were given, but without any improvement. The patient continued the next two days much about the same, the temperature reaching 103° on the 28th, and at no time falling below about 100°.

On the afternoon of Tuesday, the 29th, three days after admission, the patient had a severe rigor, and it was the occurrence of this rigor which definitely decided me in favour of the case being not typhoid fever but probably epidemic cerebro-spinal meningitis. Knowing that Dr. Percy Marsh of Liverpool was much interested in these cases, I telephoned the following day to his house in Liverpool, and found that at that moment he was in Southport in consultation with Dr. D. M. Hutton, and after I had found him here he kindly went with me to the hospital. A lumbar puncture was made and 30 cubic centimetres of turbid cerebro-spinal fluid were drawn off. On standing a thick deposit settled down out of the fluid at the bottom of the test-tube, about half to one inch in depth. Kernig's sign was well marked. Later in the evening, on obtaining Flexner and Jobling's serum from Liverpool, I injected 30 cubic centimetres of it by lumbar puncture. The fluid drawn off was reported on by Dr. O. T. Williams of Liverpool as follows: "Purulent. The stained film shows polymorphonuclear leucocytes, with intra- and extra-cellular organisms—diplococci only. No other organisms found in film. Cultures on nasgar medium give typical growths in pure culture of the meningococcus—which are Gram-negative. No other organisms grown. A typical case of meningococcic meningitis."

On each of the next four days cerebro spinal fluid was withdrawn and serum injected, and then after one day's intermission a final dose of 15 cubic centimetres of serum was injected on the sixth day. Following the first injection there was immediate improvement in the patient. The following day the retraction of the head was so much better that the patient was able to lie on her back without discomfort. There were no further rigors and the temperature gradually fell until, by the eighth day after the first injection, it was normal and remained so. The fluid drawn off became daily much less turbid until, on the last date of puncture, it was as clear as water. Microscopic films showed each day less turbidity and slighter purulent deposit, also degenerated leucocytes, and the organisms became difficult to find, and finally disappeared altogether. The girl was kept in hospital for the sake of quiet and rest until Dec. 28th and then discharged. At the time she showed no effects of her illness, except that the knee-jerk on the right side was absent and on the left very slight. She has since remained well.

Remarks by Dr. PERCY MARSH.[2]

Previous to the use of Flexner and Jobling's serum the mortality from cerebro-spinal (meningococcic) meningitis varied between 70 and 80 per cent., and in children it was 86 per cent; in October, 1909, Flexner tabulated 712 cases, which had been treated with the serum, of which 488 recovered and 224 died, giving a mortality of 31·4 per cent. (See Table.) A study of these tables emphasises strongly the importance of early diagnosis, for out of 241 who received the serum during the first three days of illness only 61 died, or 25·3 per cent., whereas of 223 who were not injected until after the seventh day 94 died, or 42·1 per cent.

Table showing Cases of Epidemic Cerebro-spinal Meningitis treated with Flexner and Jobling's Serum.

Ages (years).	Total number of cases.	Recovered.	Died.	Mortality (per cent.).
1- 2	104	60	44	42·3
2- 5	112	82	30	26·7
5-10	113	95	18	15·9
10-15	101	73	28	27·7
15-20	107	72	35	32·7
20 + ...	175	106	69	39·4
Total all ages ...	712	488	224	31·4

Cases Analysed According to Day of Injection.

Ages (years).	1st–3rd day.			4th–7th day.			Later than 7th day.		
	Recovered	Died.	%	Recovered	Died.	%	Recovered	Died.	%
1- 2 ...	16	1	5·8	22	10	31·2	22	33	60·0
2- 5 ...	24	6	20·0	40	12	23·0	18	12	40·0
5-10 ...	43	8	15·6	35	6	14·6	17	4	19·0
10-15 ...	36	8	19·0	23	9	28·1	14	11	40·0
15-20 ...	25	17	40·4	25	8	24·2	22	10	31·2
20 + ...	36	21	36·8	34	24	41·3	36	24	40·0
Totals...	180	61	25·3	179	69	27·8	129	94	42·1

The serum, which is obtained by immunising the horse with many strains of the organism, is bactericidal and only slightly antitoxic, and therefore it must be injected directly

[1] Reported at a meeting of the Southport Medical Society on Feb. 23rd, 1910.

[2] Being an Abstract of Remarks made by Dr. Marsh at the Southport Medical Society.

into the spinal canal. It is advisable, therefore, to use a needle when doing a lumbar puncture which accurately fits a syringe which will hold 15 cubic centimetres, so that if turbid fluid is withdrawn all that is necessary is to warm the serum to the body temperature, and inject slowly into the canal after removing the fluid. It is always advisable to remove if possible at least 30 to 40 cubic centimetres of cerebro-spinal fluid, and then in the case of older children and adults to inject 30 cubic centimetres of the serum on three or four successive days and further quantities based on the findings from day to day. After the first or second injection the number of organisms is decidedly lessened, and from three to seven days after the first injection the fluid tends to become clearer and the polymorphonuclear cells are lessened and replaced by lymphocytes. The organisms also tend to become more intracellular from increased phagocytosis, and the leucocytosis which is present with the disease soon disappears. In about a week the fluid becomes clear and the organisms can no longer be cultured, although a few may still be found in the films.

Upon the general symptoms the effects of the serum are equally striking: the temperature falls, sometimes by crisis; there is a rapid improvement in the general condition, with disappearance of delirium, of headache, and of vomiting, but the head retraction and Kernig's sign may remain for a few days after the disappearance of the other symptoms. After using the serum in 33 cases I am convinced of its value both as a curative agent and as preventing those painful sequelæ which we have seen with such frequency in the past in those who have recovered from this disease.

THE OCCURRENCE OF A PECULIAR PROTEIN IN THE URINE.

BY JOHN HENDERSON, M.D., CH.B. GLASG.,
ASSISTANT PHYSICIAN, ROYAL INFIRMARY, GLASGOW.

THE following case is worthy of record on account of the occurrence in the urine of a protein which in its properties does not exactly coincide with any protein hitherto described. The case was admitted to the Glasgow Royal Infirmary, under the care of Dr. George S. Middleton, who first drew my attention to the peculiar urinary condition, and to whom I am indebted for permission to investigate the case. The patient was admitted on Oct. 13th, 1909, and the following is a summary of the report upon his condition in the ward journal:—

"J. M., aged 47, miner, admitted complaining of stomach disturbance, and loss of flesh and strength, of four months' duration.

Present illness began four months ago with pain of a jagging character in his right side, radiating from the right hypochondriac to the right iliac region. This was accompanied by fulness and tenderness over the gall-bladder. The patient became 'copper-coloured,' the motions were pale and offensive, and the urine was very high-coloured. He remained at work till ten weeks ago, when he was forced to take to bed for treatment, and during this period he has improved in several respects. The pain and tenderness over the gall-bladder have disappeared, and the jaundice has quite cleared up. He has lost flesh and strength greatly and is very weak. For the past eight weeks he has had very great thirst and frequency of micturition (he had often to rise four times during the night). He does not admit having had frequency prior to this. He has never been subject to headache, giddiness, backache, or swelling of the feet. One month ago he was seized with vomiting, which took place immediately after every meal. The vomit was sour and was not associated with pain in the stomach either before or after the act. He never vomited blood. He has since been on light diet, without any sickness or vomiting ensuing, though these return whenever any heavy food is taken.

Previous health.—At the age of 13 he had 'gastric fever.' Three years ago he suffered from hæmorrhoids, from which he lost a lot of blood, over a period of two months, since when they have not troubled him further. Otherwise he had always been strong and healthy till the onset of the present illness. There was no specific history.

Family history.—He is married, and has a family of five children. His social condition is fair. His food is good, but irregular, and he often has to carry his meals and to hurry through them. He is a teetotaler and a non-smoker.

Present condition.—He is thin and emaciated, and there is no subcutaneous fat. The muscles are soft and flabby and myoidema is markedly present. There is great atrophy of the scapular muscles. His skin is sallow, and there is a marked degree of general anæmia. The teeth are fair and the tongue is moist and furred. There is strabismus and leucoma in the right eye, with blindness, the result of an injury, and in the left eye iridectomy has been performed in consequence of injury. Temperature on admission was 98·4°, pulse was 72, and respirations were 20 per minute.

Abdomen: There is no distension, swelling, or peristalsis. The abdominal wall is lax. Epigastric pulsation is visible. There is no pain or tenderness on palpation and no evidence of abdominal tumour. Liver and spleen are not palpable. Percussion note is clear all over. The lower border of the stomach reaches almost to the level of the umbilicus. The limits of hepatic dulness measure 4 inches in midsternal, 5¼ inches in nipple, and 5½ inches in midaxillary lines. *Heart:* Apex impulse is in the fifth space, in the nipple line, and is visible and palpable. The transverse measurement of cardiac dulness is 3½ inches. The first sound is booming in character and is followed at the apex by a faint V.S. murmur, which is confined in its distribution. The second sound at the apex is reduplicated. At the aortic and pulmonic areas the sounds are normal. *Lungs:* Occasional moist crackles are heard at both bases posteriorly, otherwise there is nothing noteworthy. The sputa, on examination for tubercle bacilli, give negative result. Knee-jerks are active and there is no ankle clonus. Plantar reflex is extensor. Under examination the patient shows a good deal of nervous tremor.

Urine is pale amber in colour, acid in reaction, and has a specific gravity of 1015. There is no blood, bile, or sugar present. There is no albumen present, but on heating a copious white precipitate comes down, which at once dissolves on the addition of one drop of acetic acid. Microscopic examination of the sediment, which is scanty, reveals the presence of numerous tube casts and epithelial cells. The casts are epithelial, granular, and fatty.

Blood.—Red corpuscles, 2,210,000 per c.m.; white corpuscles, 6000 per c.m.; hæmoglobin, 30 per cent. Examination of a blood film shows a very definite diminution of the red cells, which do not stain well, and vary much both in size and shape. No nucleated red cells are seen. Blood pressure in the brachial artery is 102 mm. There is no undue tenderness on pressure over the long bones.

Note on Oct. 14th (Dr. M.).—*Urine:* On boiling, a copious precipitate, by no means phosphatic in character, comes down, which dissolves on adding one drop of acetic acid. This precipitate returns on the addition of liquor potassæ in sufficient quantity to render the urine alkaline. When the urine is floated on nitric acid a copious white precipitate is obtained, which forms a thick, solid, irregular mass when shaken up with the acid. No blood, bile, or sugar is present. Tube casts, as already mentioned, are found in large numbers in the deposit.

Note on Oct. 19th (Dr. M.).—Renewed examination fails to discover anything of consequence in the heart, lungs, or abdomen. There is some undue succussion, and the gastric tympanitic note extends somewhat unduly into the lateral region. There is no undue tenderness on percussion of the bones. The urine presents similar characters to the original specimen, though the precipitate on heating is not quite so freely soluble in acetic acid.

Note on Nov. 9th.—Since last note there has been a gradually increasing weakness. The patient does not sleep well and does not take much food. He has been sick occasionally. The vomited matter contained no free acid and showed no trace of blood. The urine has constantly presented the same characteristics, and tube casts have been regularly observed, though these are not now so numerous as formerly. The average daily output of urine since admission has been 70 ounces. Examination of the blood shows red corpuscles 2,100,000 per c.m., white corpuscles 5600 per c.m., and hæmoglobin 33 per cent. No nucleated red cells have yet been observed.

Note on Nov. 13th.—The patient has daily become weaker, and to-day, at his own request, he was taken to his own home."

Remarks.—The diagnosis in this case was doubtful. The striking features were the anæmia, cachexia, and wasting,

and the condition of the urine. Careful and repeated examination of the patient failed to detect any evidence of malignant disease, the presence of which was at first suspected. There was no evidence of disease of the bones. The blood presented the characters of a fairly severe secondary anæmia. The case was regarded as one of chronic nephritis of some standing, and probably of the "diffuse" variety, accompanied by a considerable degree of anæmia and a peculiar urinary condition.

The patient unfortunately chose to go home to the country, and it has therefore been impossible to have any further observation of his general condition. We have managed, however, to obtain at intervals specimens of his urine for examination. According to the latest report—Feb. 10th, 1910—his condition has not varied much since his return home, though at times he has been very weak. A specimen of urine obtained on this date presents the same characters as the original specimens.

Through the kindness of Professor D. Noël Paton and Dr. E P. Cathcart I have been enabled to carry out a detailed examination of the properties of this unusual protein in the Physiological Laboratory, Glasgow University. Along with Dr. Cathcart I have prepared the following summary of the results obtained.

To the naked eye the urine presented nothing abnormal. Its colour was pale amber, its reaction distinctly acid, and it had a specific gravity of 1015. On subjecting it to the ordinary heat test for albumin an abundant white curdy precipitate was at once obtained. This precipitate was completely dissolved on the addition of one drop of 20 per cent. acetic acid. The precipitate had no resemblance to that of phosphates, which is frequently met with on performing this test. On contact with nitric acid in the cold a copious, thick, white precipitate was obtained, which disappeared on warming, to reappear on cooling. From these results it was evident that we had to deal with a protein other than ordinary albumin or globulin.

Professor Halliburton has remarked that "the coagulation temperature of a protein is a most untrustworthy guide to its identity." As a general rule the coagulation point of an albuminous urine may be placed somewhere about 70° C., and the coagulum thus obtained shows no tendency to disappear on raising the temperature to boiling point, and is insoluble in acetic acid. The protein present in this case coagulated at 56° C., and on further raising the temperature apparently tended partially to return to solution. As already noted, it was completely dissolved on the addition of one drop of acetic acid.

Further, an ordinary albuminous urine gives a precipitate on contact with nitric acid, which precipitate persists on short heating at 100° C. The present protein precipitated as usual in the cold with nitric acid, but disappeared on warming, to reappear on cooling.

With alcohol, ordinary protein is precipitated, and on heating this precipitate persists. In this case the precipitate occurred as usual in the cold, but disappeared on warming, to reappear on cooling.

All the ordinary protein tests were obtained—viz., marked biuret, Millon, marked Liebermann, and tryptophane reactions, and on boiling the urine with lead acetate in alkaline solution it blackened.

The protein was precipitated by all the ordinary reagents which precipitate proteins—viz., trichloracetic, tannic, and picric acids, &c. The protein was fully precipitated on half saturation with ammonium sulphate. After filtration this precipitate was dialysed against running water, and the product left in the sausage-paper behaved quite as in the original urine. The ammonium sulphate precipitate was further dialysed till free from salt, and it again showed the same properties. The material obtained from this salt-free product, either taken down to dryness in vacuo at a low temperature or precipitated with alcohol and dried, was found to be a whitish-grey powder, ash-free, and when in solution it possessed all the properties of the original body in the urine.

At various times unusual proteins have been described as occurring in the urine by Bence-Jones, Huppert, Ribbinck, Kühne, Noël Paton, and others, but though in some respects it offers points of resemblance, our protein does not correspond to any hitherto described.

With regard to the exact nature and source of this protein it is impossible to say anything meantime, but in a later paper we hope to discuss this question.

Glasgow.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

CLINICAL SECTION.

Endothelioma of the Tongue.—Exhibition of Cases.

A MEETING of this section was held on April 8th, with Mr. A. PEARCE GOULD in the chair.

Mr. F. S. EVE read a paper entitled "Three Rare Tumours of the Base of the Tongue (Two of them Endotheliomata), with Remarks on the Surgery of Malignant Disease of the Tongue." In discussing the surgical aspects of the cases, he said that he considered that Syme's operation of severing the mandible was the best method of removing any growth involving the posterior half of the tongue, especially if it implicated the floor of the mouth. He did not consider that any growth of the floor of the mouth could be satisfactorily removed without dividing the mandible. The advantages of Syme's operation were that the lingual arteries were easily secured, the tissues of the floor of the mouth could be cleanly detached from the mandible, and the muscles attached to the tongue could be divided near their origin. The tongue should, as a rule, be removed before the glands. The disadvantages of Syme's procedure were that the wire used for uniting the jaw often gave rise to sinuses; also delayed union might occur and the fragments become loose. These disadvantages could be avoided by using a dental splint. Mr. Eve explained a method of removing glands from the neck, and thought that with certain exceptions only the glands on the affected side need be removed unless those on the opposite side were actually enlarged. The exceptions were, however, numerous, and included all growths originating in or approaching the middle line, those deeply infiltrating the under surface of the tongue, and those arising at the tip of the tongue or implicating the floor of the mouth at or near the frænum.

Dr. F. H. JACOB described a case of Acholuric Jaundice. Slight yellowness was noticed in the patient two years ago; there was weakness one year ago. Continuous slight jaundice with exacerbations, an enlarged spleen, great irregularity in the size of the red cells, and a number of nucleated red corpuscles were observed.—Dr. H. D. ROLLESTON suggested that a better name than acholuric jaundice was hæmolytic jaundice.

Dr. N. S. FINZI showed a case of Sarcoma of the Ear and Mastoid Region under radium treatment. The patient, a boy, aged 8 years, complained of earache in May, 1909, and was found to have a polypus. It proved to be sarcoma. A recurrence was treated by Coley's fluid in November last; there was temporary improvement, after which the growth made steady progress. When the boy came under Dr. Finzi's care on Feb. 15th, 1910, he had a large fungating bluish mass behind the ear about 1¼ inches in diameter. There were large fixed glands below the ear and under the sterno-mastoid, also small glands at the apex of the posterior triangle. Radium treatment was given, and in a week's time from the first application there was marked improvement, the growth and glands being smaller and much less tender, and that had since continued.

Dr. FINZI and Dr. WILLIAM HILL showed two cases. The first was a case of Malignant Growth in the Neck treated with Radium, with Recurrence in the Mediastinum. The patient was exhibited to demonstrate the possibility of treating large and deep malignant growths with radium; to show the necessity of thorough and radical treatment, which had not been sufficient in this case; and to show the ease with which a mediastinal growth could sometimes be seen in an instantaneous radiogram. The second case was one of Œsophageal Growth under treatment by radium. The growth was stated to be endothelial sarcoma. The improvement was demonstrated by means of radiograms. Dr. Hill demonstrated on this patient the method of inserting the radium apparatus into the gullet by means of his new form of œsophagoscope.

Mr. CHARTERS J. SYMONDS showed a case of Rodent Ulcer treated by radium by Dr. C. E. Iredell at Guy's Hospital. This patient was exhibited last December, and the radium had been, with a short interval, steadily applied. Improvement had progressed, and since the patient was last shown the induration on the outer side had almost entirely disappeared; particularly noticeable was the change in the lower

eyelid, which had become quite supple. The thickening connected with the lower part of the wound might, it was hoped, be attributed entirely to the cicatrisation.

In the discussion which followed Mr. C. R. C. LYSTER (Middlesex Hospital) said that during his experience with radium he had never seen deep-seated malignant growths influenced by radium. He agreed that superficial rodent ulcers could be easily and satisfactorily dealt with by radium.—Dr. W. S. LAZARUS-BARLOW (Middlesex Hospital) said that the cases shown were of the indeterminate type of cancer belonging to a group which he defied anyone to distinguish with dead certainty from inflammatory tissue. He knew from working in the laboratory that radium could cause acceleration as well as retardation of the development of cells. Clinical workers with radium would be very sorry for themselves if they ultimately found that instead of curing what they thought was cancer they produced what they knew to be cancer.—Mr. EVE described a case in which under the X rays an inoperable tumour of the neck disappeared.—Dr. HILL did not consider that radium would cure an advanced case of malignant disease of the œsophagus, but it would give relief.—Dr. FINZI believed that radium could influence a growth quite three inches from the surface.

Cases were also shown by Dr. F. PARKES WEBER and Dr. E. MICHELS, Dr. W. P. HERRINGHAM, Dr. A. F. HERTZ and Dr. F. S. ADAMS, and by Mr. GWYNNE WILLIAMS.

LARYNGOLOGICAL SECTION.

Exhibition of Cases and Specimens.

A MEETING of this section was held on April 1st, Dr. J. DUNDAS GRANT, the President, being in the chair.

Mr. HERBERT TILLEY showed: 1. A case of Healed Tuberculous Laryngitis treated by galvano-puncture. The patient, a woman aged 27 years, complained of hoarseness and was under sanatorium treatment for pulmonary tuberculosis. The left ventricular band was swollen, so that the corresponding vocal cord was invisible. Four deep punctures with the galvano-cautery had brought about the present satisfactory condition. 2. Intra-tracheal and Extra-tracheal (Tracheotomy Wound) Masses of Papillomata removed from a patient shown at the last meeting. 3. A Vulsellum-catch Forceps for firmly securing submerged tonsils in the operation for their more efficient removal. 4. A portion of Mutton-bone removed from the Right Bronchus of a woman, where it had been lodged for ten days. Her symptoms were constant irritating cough, numerous râles over the right base of the lung, and temperature 102° F. Removal under general anæsthesia.

Dr. G. C. CATHCART showed a girl, aged 12 years, in whom the Epiglottis was enormously Tumefied, completely Obscuring the Glottis, suggesting Tuberculosis. There were numerous enlarged glands in the neck. The patient had had diphtheria four years ago.—The PRESIDENT thought that it looked like tuberculosis of a mitigated type, and suggested application of the von Pirquet test.

Dr. L. H. PEGLER showed a case of Extreme Deflection of Triangular Cartilage, with Crest and Adhesions, and Anterior Prickle-shaped Spur, treated by Septal Fissure. Dr. Pegler's septotomes in different sizes were shown. The patient, a young man, aged 19 years, complained of recurring attacks of deafness, inability to breathe through the left side of the nose, constant "catching cold," and a disagreeable sniffing which annoyed both himself and his friends. Examination showed very marked deflection of the septum with ascending crest to the left, extending from a thorn-like spine in front to beyond the junction with the ethmoid plate posteriorly. The spur and anterior part of the crest were joined by adhesions to the inferior turbinal anteriorly, the atrophied condition of which still remains. A slight groove in the right side of the septum marks the angle of deflection. The right inferior turbinal was hypertrophied but breathing was carried on fairly comfortably on that side. Treatment consisted in sawing away the spur and crest under chloroform, followed by septal fissure on Moure's principle with Dr. Pegler's special forceps (septotome), and after right partial inferior turbinotomy inserting a thick indiarubber splint. The septum was forced over by the finger after the incisions had been made until the two cavities corresponded in capacity as they do now. The splint was worn quite comfortably for one week. The deafness, sniffing, and a troublesome watery discharge from the right and free nostril have ceased and the breath way is perfect.

The PRESIDENT showed: 1. A case of Malformation of the Soft Palate and Uvula in a girl aged 16 years. There was a perforation above and to the right side of the base of the uvula, but the nature of it was quite undecided. There was no such cicatricial tissue as would accompany a specific perforation and no history of such traumatism as could have accounted for it. 2. A case of Removal of Hypertrophied Anterior Lip of the Hiatus Semilunaris for long-standing muco-purulent catarrh in the ethmoidal cells and frontal sinus. Both middle turbinals were partially resected, but no relief from catarrh or headache was obtained until the operation on the outer wall was effected.

Dr. G. WILLIAM HILL showed a case of probable Sarcoma of the Right Tonsil in a woman, aged 48 years, of 12 months' duration.

MEDICAL SOCIETY OF LONDON.

Exhibition of Cases.

A MEETING of this society was held on April 11th, Dr. SAMUEL WEST being in the chair.

Dr. F. PARKES WEBER and Dr. G. DORNER showed a case of Chronic Muscular Atrophy (chiefly affecting the thigh muscles). The patient, a young man, aged 21 years, complained of muscular weakness in his legs, which prevented him from getting upstairs easily, and even made it an effort to cross his thighs when sitting down. He could not mount on to a chair as most persons could. There was likewise a certain deficiency of power in the movements of his shoulder-joints and upper extremities. On examination he appeared to be well developed except in regard to certain muscles. That the psoas and iliacus muscles were very much affected was shown by the patient's difficulty in flexing the thighs on the pelvis. The big muscles of the front and inner aspects of the thighs were weak and wasted and did not react to faradic stimulation. The wasting of the thigh muscles gave him something of a "Vogelbein" appearance of Hoffmann. The supraspinatus, infraspinatus, pectoralis major, and part of the deltoid muscles were likewise poorly developed, and the lower portions of the pectoralis major muscles did not react to faradism. The calf muscles were very large, and there was no obvious wasting in the muscles of the face, the muscles of the hands or of other parts not yet mentioned. The knee-jerks could hardly be obtained—that is to say, they were represented only by a slight muscular contraction. The plantar reflexes were normal. Fibrillary muscular twitchings could be sometimes observed in the muscles of the upper part of the trunk, the extremities, and the neck. The history was that at 10 years of age he was not able to run as well as ordinary children could. At 13 years there was some difficulty in getting upstairs and in mounting on a chair. The weakness in the legs had slowly increased, and since 15 years of age there had likewise been some loss of power in the upper extremities. In regard to other illnesses, it might be noted that he had gonorrhœa at 18 years of age, and he practised masturbation a good deal from 12 to 16 years of age. There was no history of any similar muscular atrophy in other members of the family. The disease appeared to be a form of very slowly progressing myopathy, chiefly affecting the thigh muscles, a type of myopathy to which Dr. Thomas Buzzard had specially drawn attention; it was analogous to Erb's juvenile type of myopathy in which the upper arm musculature chiefly suffered.

Dr. PARKES WEBER also showed a case of Osteopathy and Perforating Ulcer of the Foot in Syringomyelia and a case of Arteritis Obliterans of the Left Leg.

Mr. DOUGLAS DREW showed radiographs and lantern slides illustrating a case of Old-standing Dislocation of the Foot forwards, with fracture of the neck of the astragalus and displacement of the fibula on the tibia, which he had recently operated on. The injury resulted from violent flexion of the foot on the leg as the result of an accident while bobsleighing. It was found to be impossible to reduce the dislocation, which had been present more than a month, either by manipulation or by operative means until the astragalus had been removed. Mr. Drew commented on the rarity of the injuries and on their mode of production.

Mr. H. TYRRELL GRAY and Dr. L. G. PARSONS showed a Clinical Instrument for consecutive and simultaneous graphic records of the respirations, pulse, and blood pressure over a prolonged period of time. The apparatus was based on Dr.

Gibson's well-known instrument for obtaining a graphic record of the blood pressure. The following were its distinctive features: provision was made for a continuous tracing (50 feet of paper) over a period of about two hours; additional levers, connected with tambours for recording respiratory excursions, apex beat, and the pulse; and an adjustable lever marking a base line.

Dr. F. DE HAVILLAND HALL showed a case of Intrathoracic Aneurysm in a man, and Mr. CHARTERS J. SYMONDS showed a man upon whom he had operated for Abdominal Aortic Aneurysm by inserting bronze aluminium wire.

Mr. A. E. BARKER showed two patients, one a case of attempted Bone Grafting of the Tibia and the other a case of Rhino-scleroma.

Mr. W. H. BATTLE showed a case of Lipoma of the Left Palm and a patient with Neuropathic Disease of the Hip.

Dr. J. WALTER CARR showed a girl suffering from Fixation of the Joints (? Fibrous Myositis).

Dr. F. S. PALMER demonstrated a case of Total Ophthalmoplegia in a woman.

MANCHESTER MEDICAL SOCIETY.—A meeting of this society was held on April 6th, Mr. E. Stanmore Bishop, the President, being in the chair.—Dr. W. Milligan read a paper upon the Surgery of the Faucial Tonsils, with special reference to the operation of enucleation. The development and the anatomy of the faucial tonsils were first considered, special stress being laid upon the importance of recognising the supra-tonsillar fossa as a "dangerous zone." The faucial tonsils were then discussed as portals of infection, reference being made to the incidence of tuberculosis, rheumatic fever, &c. The operation of tonsillectomy was strongly recommended in preference to tonsillotomy and reasons were advanced for this preference. The various complications following operations upon the tonsils were then detailed, special mention being made of hæmorrhage and of the methods in use for dealing with it. Finally, the question of the administration of anæsthetics in operations upon the tonsils was considered and the advantages of operations under general anæsthesia were insisted upon.—Dr. G. E. Loveday gave an account of investigations he had recently made on the serum diagnosis of syphilis. The method employed was that advocated by Dr. Alexander Fleming, in which an alcoholic extract of heart muscle made up to 10 per cent. in normal saline was used as antigen, and sheep's corpuscles (normally hæmolysed by human serum) washed and made up to a 10 per cent. suspension in normal saline were used as an indicator. Using this method 44 out of 45 cases of clinical syphilis gave a positive reaction. On investigating controls, some cases which had almost certainly not had syphilis gave positive reactions. The extract was therefore reduced in strength and experimentally standardised to give a positive reaction only in syphilitic cases. The results with the standardised extract to date were: Out of 20 cases of clinical acquired syphilis 18 positive and 1 doubtful and 1 negative reactions were obtained. Out of 52 control cases 51 gave a negative and 1 a positive reaction; this case upon inquiry gave a history very suspicious of syphilis. The controls embraced, amongst others, cases of bacterial infection, gonococcal, tuberculous and pneumococcal cases, and cases of anæmia and chlorosis. The reaction was considered reliable.—Dr. G. H. Lancashire described a case of Chronic Cruro-genital Eczema which developed suddenly while in hospital into an acute gangrenous condition, from which the patient died. The course of events pointed to an acute infective process, probably auto-infection.—Dr. Arthur Sellers, who made a pathological investigation of the organs after death, reported that on bacteriological examination the staphylococcus pyogenes aureus and bacillus pyocyaneus were found in enormous numbers in the gangrenous skin, in the kidneys, spleen, and liver, but not in the blood.

THE LATE DR. GEORGE CARPENTER.—In our obituary notice of the late Dr. George Carpenter the Queen's Hospital for Children was alluded to as being a separate institution from the "North-Eastern Hospital for Children," whereas there is but one hospital which was known as the "North-Eastern Hospital for Children" until 1908, when its name was changed with the sanction of Her Majesty Queen Alexandra and the King. Dr. Carpenter was appointed assistant physician to the hospital in 1903 and full physician in 1905.

Reviews and Notices of Books.

Accidental Injuries to Workmen with Reference to Workmens' Compensation Act, 1906. By H. NORMAN BARNETT, F.R.C.S. Edin. London: Rebman, Limited. Pp. 384. Price 7*s.* 6*d.* net.

IN this work Mr. Norman Barnett has had the advantage of the coöperation of Dr. Cecil E. Shaw, who has written an article on Injuries to the Organs of Special Sense, and of Mr. Thomas J. Campbell, M.A., LL.B., barrister-at-law, who has written the legal introduction. Since the introduction of the Workmen's Compensation Act of 1906 the need has been felt of a work which should deal comprehensively with the very difficult and vexed question of accidents and their results relative to the Act. The authors claim to have supplied this want and they are certainly to be congratulated on the success of their efforts. There is no doubt that everyone who is engaged in cases relating to the compensation of workmen will find the book of very great assistance, and there is a large amount of most useful information and advice which cannot fail to be of the greatest help to any medical man who is called upon to give evidence in cases of this kind. Also, the book will be of equal value to members of the legal profession, many of whom are frequently engaged in cases of this class.

The legal introduction is admirably written, and it brings out clearly the far-reaching changes which the new Act has made in the relation of employer and employee. It also continually emphasises the fact that these changes are for the benefit of those whose lot it is to toil and to earn their daily bread by the sweat of their brow. The term "accident" is not defined in the Act, and, as is stated, the question of accident is in very large degree a question of fact, so that naturally in any particular case different views are likely to be taken by the various parties concerned.

Numerous illustrations are given of typical legal cases in which difficulty arose in the decision as to whether the occurrence was an accident or not. The application of the Act to industrial diseases is fully considered. The various classes of persons coming under the definition of "workmen" are given, and also those to whom the term employer may apply. The considerations which are brought into play in determining the amount of compensation to be awarded as the result of an accident are fully discussed. Some excellent advice is given as regards the medical examination in compensation cases, and also as to the manner in which a medical man should give his evidence. It is satisfactory to learn that, in the opinion of the authors, medical men acquit themselves, with singularly few exceptions, in a manner creditable to their profession.

The question of compulsory operation in cases where workmen are claiming for injuries which might be benefited by surgery is fully discussed, and several very interesting cases are cited, going to show that if a workman refuses to undergo an operation which is likely to remove some of the effects of his injury then this refusal will be seriously taken into account in determining the amount of compensation due to him. A very important chapter deals with the making of medical reports and the giving of medical evidence. The advice given here is sound and helpful.

A brief account is given of the various injuries which may occur to the different bodily structures, but of necessity the space devoted to them is much too small for adequate treatment. It is obvious that special works in surgery must be consulted for information of this kind. The injuries to the organs of special sense are dealt with as fully as the limited space will allow, but here again it will be necessary for the medical witness to consult larger works in order to get the

necessary information which will be required in a particular case. In the appendix is given in full the Workmen's Compensation Act, and also a list of industrial diseases, and the report of the Departmental Committee on compensation for industrial diseases.

In conclusion, we again emphasise that the book is a valuable contribution to medical and legal literature; it should be possessed by everyone who is likely to be engaged in cases coming under the Workmen's Compensation Act.

The Human Species, considered from the Standpoints of Comparative Anatomy, Physiology, Pathology, and Bacteriology. By LUDWIG HOPF. Authorised English edition. With 216 illustrations and seven plates. London: Longmans, Green, and Co. 1909. Pp. 457. Price 10*s.* 6*d.* net.

THE science of anthropology is one which, from its very nature, should be of interest to members of the medical profession. Although as practitioners their attention is more particularly confined to the investigation of abnormal and diseased conditions, yet the study of man's place in nature, of his evolution and of his relations, both morphological and psychological, to the other members of the animal kingdom, is fraught with interest, and may be pursued with advantage. It is with such problems as these that Professor Hopf's interesting book deals. It contains within very moderate compass and presented in readable style a large amount of information, carefully marshalled and intelligently discussed.

The first part is devoted to a brief but interesting review of the surmises of primitive and savage tribes, and of the speculations of philosophers, ancient and modern, as to the origin of man, followed by a consideration of the distribution of mankind and of the various classifications of the human race. This part concludes with a general discussion of the discoveries made in regard to fossil apes, tertiary, quaternary, and neolithic man.

The second part, which is much larger than the first, is divided into three sections, dealing respectively with comparative anatomy and histology, comparative physiology and psychology, and comparative pathology and pathological anatomy. The aim the author had in view is, as he expresses it himself, "the comparison of the essential characeristics of man with those of the lower animals in the light of the results of recent research. Many a character hitherto regarded as distinctively human will be found to be shared by the lower animals, many another be proved man's indisputable possession, though here and there he may not be particularly edified thereby." In regard to the anatomy, histology, and physiology of human structures, as compared with those of animals, copious measurements and details are given and many illustrations, while any particular features or characteristics special to the human species are carefully indicated. Without doubt, however, the most interesting section of Professor Hopf's book is that dealing with the comparative psychology of man and animals. After briefly discussing the abode of the mind and the monistic and dualistic theories as to its nature, he proceeds to investigate the relation of the human to the brute mind. After referring to the dualistic or anthropocentric view of Descartes, and to the work of Darwin, he passes on to consider the view of Haeckel, supported by Klaatsch, that there is a psychic evolution up to man through the animal kingdom analogous to the progressive evolution of anatomical and physiological characters. The tendency of all modern investigations is to support strongly the view "that the psychical differences between man and animals are of degree only and not of kind." Professor Hopf, however, while admitting that animals act with deliberation, denies them the faculty of reason—i.e., the power of forming abstract as opposed to concrete judgments and associations of ideas. In this he parts company with Darwin and Haeckel; indeed, he goes further, and states that the faculty of reason seems entirely wanting in certain savages. Curiosity and the capacity to count are to be found in animals, as is also the power of measuring, but weighing is a faculty confined to man. Interesting accounts are given of the powers of speech and of the means of emotional expression in animals and their relation to those of man.

After briefly considering impulses and instincts Professor Hopf deals with social impulses and observances in man and animals in a few pages of striking interest. This section concludes with descriptions of modern discoveries in regard to the origin of religion, arts and handicrafts, painting, music, and writing in primitive man, and is illustrated with reproductions of various remains of the weapons and utensils employed, including the knotted cords of the South Sea Islanders, which served as genealogical registers and historical records. The last section is devoted to a review of comparative pathology and is necessarily brief, but it is suggestive and valuable, as indicating what a fruitful field this may be for further research. A brief appendix on comparative therapeutics contains some interesting observations on instances of mutual help and of the treatment of wounds in the animal kingdom.

We have read Professor Hopf's book with interest and can commend it as an instructive work on anthropology. We may also congratulate the translator upon the manner in which he has carried out his task; we cannot do this by name, as he modestly withholds his identity.

Gonorrhœa in Women. By PALMER FINDLEY, M.D., Professor of Gynæcology in the College of Medicine of the University of Nebraska, Omaha. St. Louis, Mo., U.S.A.: The C. V. Mosby Medical Book and Publishing Co. 1909. Pp. 112.

THE author has written this book for the purpose of awakening his readers to a greater appreciation of the supreme importance of the subject of gonorrhœa in women. In a short historical sketch he points out that the history of gonorrhœa is as old as the human race, and calls attention to the numerous references to the disease in the Bible. The large part played by this affection in the production of various inflammations of the female genital organs was first brought prominently before the notice of the profession by Noeggerath in 1878, but the full significance of the lesions caused and of their extent was first rendered certain by the discovery of the gonococcus by Neisser. From this time our knowledge of the occurrence of gonorrhœa in the female has been placed upon a sure foundation, since before the recognition of the gonococcus it was impossible to say with certainty whether a vaginal discharge was due to this disease or not. Undoubtedly Noeggerath exaggerated the facts. For instance, he affirmed that 80 per cent. of married men have had gonorrhœa, that 90 per cent. of these had never been properly cured, and that of every five married women three had acquired gonorrhœa. It is impossible to credit these statistics and they are undoubtedly exaggerated; but at the same time it must be admitted that the assertions of Noeggerath did a great deal of good, since they called attention to the fact that many women are in reality the victims of an uncured gleet in their husbands and that this condition is an important factor in the production of sterility in the female.

One of the great difficulties in the study of the gonococcus is that it can be grown outside the human body only very exceptionally. The author quotes Turro, who claims that he has grown it in acid media and successfully inoculated it into dogs, but, on the other hand, Bumm affirms that the

organism can only be successfully inoculated in the human body. It is a fortunate coincidence that the gonococcus soon loses its virulence when dried, otherwise epidemics of the disease would be not infrequent. While the frequent involvement of the glands of Bartholin is well recognised it is not so well known that the occurrence of suppuration in these structures is nearly always the result of a mixed infection with the staphylococcus, and the gonococcus has but little power of penetrating deeply into the tissue in this position.

The important part played by the gonococcus in the production of puerperal fever has only been fully realised of late years, and the author is therefore justified in insisting upon this with much emphasis. One of the most interesting sections is, indeed, that in which he discusses the question of gonorrhœal puerperal infection. Dr. Findley quotes from Taussig, who has given a good description of the clinical course of these cases, and who says that this form of puerperal infection is to be distinguished from streptococcic infection by its late onset, the moderate degree of fever, the absence of any signs of severe intoxication, and by the regular and proportionately slow pulse. The diagnosis must, however, rest upon the microscopical examination of the lochial discharge. Upon the whole the author is an upholder of the views of Noeggerath and is much impressed with the large number of cases of disease of the female genital organs which he believes have the gonococcus as their cause.

Dr. Findley has given a clear and interesting *résumé* of the subject, and if we do not altogether agree with his conclusions we must admit that he has many arguments on his side, and, as he points out, the more systematic bacteriological examination of cases of gonorrhœa in women would no doubt tend to prove his contentions. The book is an interesting one and thoroughly worthy of perusal.

Exercise in Education and Medicine. By R. TAIT MCKENZIE, B.A., M.D., Professor of Physical Education and Director of the Department, University of Pennsylvania. London and Philadelphia: W. B. Saunders Company. 1909. 8vo. Pp. 406. Price 15*s.* net.

THIS is an excellent book. Large as the subject is, the whole ground is covered and the author has dealt with its varied aspects equally well. It is so well written that, copious as the volume is, and full of technical details, it is interesting to read from end to end, while it would form an admirable compendium for reference both to those engaged in education and for general practitioners of medicine.

In the opening chapter it is difficult to accept the writer's definition of "second wind" as the "re-establishment of equilibrium between the production of waste and its elimination"; such a readjustment could not take place in so short a time. Second wind is a readjustment that occurs chiefly in untrained persons and is a cardiac phenomenon. The heart urged to a more rapid and powerful systole becomes distressed until it gets better accustomed to the rate of contraction required of it. The establishment of this condition is best seen in rowing, in which exercise the cardiac rate is determined by the respiration rate which is absolutely dependent on the rate of stroke. The account of the physiological output and "condition" of athletes describes a state which should not occur; and we doubt if it often does occur among athletes in England of any position in the athletic world, whether at schools or universities, or in any well-trained clubs. Professor McKenzie gives a most interesting account of the history of modern German and Swedish exercises illustrated with reproductions of numerous photographs; and such matters as jiu-jitsu and the Delsarte system and other kindred muscular methods are admirably and easily sketched.

There are full and sound chapters on exercise in education and the improvement of the physique of the very poor and the mentally defective. Some of the best parts of the book are those on exercise as applied to pathological conditions, notably those relating to flat-foot and scoliosis. The description of the mechanical problems of the feet is clear and well-written; and the exercises advised are closely studied and set forth in comprehensible terms. Other good matter are the sections on Oertel's treatment, on Schott's passive movements, and on the training of ataxia, based largely on von Leyden's methods. The illustrations of the Schott movements are photographed from life and are not as clear as the rougher line drawings such as those in Dr. W. Bezly Thorne's brochure. Well informed as Professor McKenzie is, he is careful to insist on the limitations of exercise and massage in medicine, and to avoid the common quackery of claiming that these methods can cure every mortal ill.

LIBRARY TABLE.

A Practical Guide to the Administration of Anæsthetics. By R. J. PROBYN-WILLIAMS, M.D. Durh. Second edition. London: Longmans, Green, and Co. 1909. Pp. 228, with illustrations. Price 4*s.* 6*d.* net.—That this little book should have entered a second edition is sufficient proof of its merits as a manual of instruction to the student. The new edition contains short accounts of the use of ethyl chloride and of spinal analgesia which were not previously included. In some other respects, however, the author has not taken full advantage of the advances that have been made in anæsthetics since the production of his first edition. He does not give a sufficient account of the use of ether by the open method, nor any at all of the application of this for nasal inhalation in long operations for removal of the tongue, &c.,[1] and he might with advantage have devoted a little more space to the treatment of the important condition known as "delayed chloroform poisoning," in connexion with which so much has been written on which he could have drawn. Furthermore, much has been learned in connexion with the treatment of shock of which the author has not, we think, sufficiently availed himself. It is, however, ungracious to cavil at sins of omission in an intentionally compressed book, and we prefer to point out the general excellence of the arrangement of the material, the great superiority of several of the illustrations over those usually found in a work of this character, and the admirable clearness of description where complicated apparatus is concerned. We should like, by-the-bye, to have seen some description of one, at least, of the "plenum system" of chloroform-regulating inhalers and a consideration of the advisability of this method.

Text-book of Nervous Diseases and Psychiatry. By CHARLES DANA, M.D., LL.D., &c. Seventh edition. London: J. & A. Churchill. 1909. Pp. 782. Price 25*s.* net.—This is the seventh edition of Professor Dana's text-book. So far as the neurological section is concerned revision has brought its material up to date, while much has been added in the descriptions both of organic and functional disease. The author has made material additions to the sections on histology and on the anatomy and physiology of the brain. It is perhaps unavoidable that in a book intended for students and practitioners a rather more dogmatic tone than the actual state of our knowledge warrants should be adopted, while much that has tentatively been adduced by investigators is clothed in words which suggest that the points in question are *choses jugées*. The section on psychiatry is meagre, and neither the classification adopted nor the descriptions of the various syndromes are really up to date. The style of the work is not unexceptionable. In several instances, though we have thought that

[1] THE LANCET, May 7th, 1909.

we have caught the meaning of the author, we have had to remain in doubt, since the purport of the words, as we have assumed it, has not been their face meaning. Spelling also is not infrequently at fault. The illustrations have been well selected.

Obstetrics for Nurses. By JOSEPH B. DE LEE, A.M., M.D., Professor of Obstetrics, Northwestern University Medical School. Third edition, thoroughly revised and enlarged. London and Philadelphia: W. B. Saunders Company. 1909. Pp. 512. Price 12*s.* net.—In reviewing the first edition of this book we indicated that it was likely to be of great assistance to nurses and that we could recommend it. The fact that the present is the third edition shows that it has met with the success it deserved, and we have no doubt that other editions will in due course be called for. Very little change has been found necessary in this edition. A special feature of the work is the illustrations, which are exceedingly good and should be very helpful to nurses in elucidating the text. The section on premature infant feeding is one of the best in the work, and we have read with much interest the description of what Dr. De Lee calls the "incubator station" of the Chicago Lying-in Hospital. The arrangements appear to be most complete, and even include an incubator ambulance for the transport of these premature children to the hospital. This is a perfect incubator in miniature, with a circulating hot-water system heated from the outside by an alcohol lamp, well ventilated, and lighted by electricity. It can be readily carried by one person, and the child in transit can be observed through a window in the top. The glossary has been made more useful by inserting page references to the text, so that a nurse after obtaining a definition of a word may refer to the text for a full description of the subject. There is a good illustration of Bier's congestion method of treatment for mastitis. We have no doubt that nurses who read and profit by this book will, as the author hopes in his introduction, become in reality missionaries spreading the gospel of good obstetrics.

International Sport. By THEODORE ANDREA COOK. London: Constable and Co. 1910. Pp. 255 + 181. Price 3*s.* 6*d.*—The subtitle on the title-page not only reminds us of the days of Queen Anne but forms an excellent digest of the scope of the volume: "A Short History of the Olympic Movement from 1896 to the Present Day, containing the Account of a Visit to Athens in 1906 and of the Olympic Games of 1908 in London, together with the Code of Rules for Twenty Different Forms of Sport and Numerous Illustrations." There is no doubt that the rules adopted at the Olympic Games will exert a wide influence in the near future on all athletic competitions, even in the smallest villages, and gentlemen who are asked to act as judges and officials in rural sports who have, perhaps, not gained any systematic experience will find this volume valuable. Apart from that value the volume is interesting as a record of important athletics and as a sketch of the modern antiquarian view of Athens and the Illyrian coast. The author is one of the highest authorities on athletics, a well-known oar, a swordsman of the first class, and the editor of the leading journal of sports in the world, while his works descriptive of mediæval France are valued alike for charm of writing and accuracy of detail. The same charm and accuracy of archæology present themselves in the account given here of Athens, Spalato, and Ithaca. The question of the value of international contests in sport is a difficult one: the view that they cause too much friction and ill-feeling is not without a good deal of support. But it is probable that the disputes over athletic events are accentuated in the press for journalistic purposes, while an enormous quiet *camaraderie* of feeling is established between the competitors and their supporters. There are about 1000 competitors in these big international meetings, and if a dozen of them emerge with grievances against the judges the balance of good feeling is on the right side.

JOURNALS AND MAGAZINES.

Archives of Internal Medicine. Vol. V., No. 2. Feb. 15th, 1910. Chicago: American Medical Association. Price $4 per annum of two volumes. Single copies, 50 cents.—The contents of this number are: 1. The Effect of Digitalis on the Ventricular Rate in Man, by Dr. A. W. Hewlett of Ann Arbor and Dr. J. T. Barringer of New York. Two cases are recorded and tracings are given illustrating the effect of digitalis upon the ventricular rhythm. 2. Emphysematous Gangrene due to a Member of the Colon Group, by Dr. Robert Goldsborough Owen of Iowa City. He finds that emphysematous gangrene may be due to anaerobic or to aerobic organisms, the most common agent being the bacillus aerogenes capsulatus, otherwise known as bacterium Welchii. An organism described by Lanier, which Welch regards as an aerobic variety of his gas bacillus, together with organisms described by San Felice, Corner and Singer, and Klein, should, according to Dr. Owen, all be regarded as varieties of the bacillus coli. 3. An Experimental Study of the Antitryptic Activity of Human Serum, by Dr. Richard Weil of New York. A satisfactory explanation of this phenomenon is regarded as impossible until further work clears up some of its details. 4. Some Cases of Low Temperature, by J. F. Munson of Sonyea, New York. Some interesting cases in which a considerable degree of hypothermia was observed in an asylum are recorded. It was found to occur in patients of low mental grade suffering from some acute or chronic infection, and in most instances it was agonal or pre-agonal. 5. The Problems of Experimental Nephritis, by Dr. Richard M. Pearce of New York. This important paper contains an interesting review of recent work on the subject and has an extensive bibliography appended to it. 6. A Study of the Presphygmic Period of the Heart, by Dr. G. Canby Robinson and Dr. George Draper of Philadelphia. The authors find that the presphygmic period, which is the time that elapses between the commencement of ventricular systole and the opening of the aortic valves, is from 0·07 to 0·085 second normally, and that its duration may vary markedly under various pathological conditions. Details of these variations, illustrated by tracings, are given, and the authors hope by further work to establish their prognostic value.

The Burlington Magazine.—We have received the April number of this sumptuous monthly magazine, the contents of which make, as usual, an intimate appeal to all interested in different phases of art and artistic production. There are many medical men who are virtuosi, and a collection of the paintings, prints, etchings, china, and silver in possession of the medical profession would form a very noteworthy exhibition. Those of our readers who are in this class hardly need to have the merits of the *Burlington Magazine* brought before them. But apart from avowed collectors who take a special interest in particular phases of art, there is a large class of medical men, and we know that it is growing, who admire and enjoy works of art without either making a collection or aspiring to the position of the expert. To these the article by Mr. Claude Phillips on the Italian pictures of the Salting collection will be of great use. It happens that this group of pictures is not, as Mr. Phillips allows, one whose importance is obvious on a superficial survey, and his straightforward comments upon it are likely to be useful to many members who hardly recognise the debt owing to the deceased benefactor of the National Gallery.

THE LANCET.

LONDON: SATURDAY, APRIL 16, 1910.

The Debate on the Prevention of Destitution Bill.

ON the afternoon of Friday, April 8th, Sir ROBERT PRICE moved in the House of Commons the second reading of a Bill drafted with a view to carrying into effect the reform of the Poor-law upon the lines laid down in the Minority Report. It can hardly have been expected by anyone in the House that the debate which followed would be closed by the fulfilment of its avowed object, and in the end the discussion of the Bill stood adjourned soon after 5 o'clock with little prospect of immediate renewal. Nevertheless, it cannot be said that nothing was achieved. The laying before the House of Commons of a concrete proposal for Poor-law reform, contained in a Bill consisting of 95 clauses, and with references to 80 existing Acts of Parliament, will enable many to realise more clearly than they have already done that the "breaking up of the Poor-law," a phrase with which they have become very familiar during the past few months, is not a legislative step which can be taken with a light heart and an easy mind in the course of a session's ordinary work. Our readers, at any rate, will find a great deal that is both instructive and interesting in the speeches which resulted in the measure in question being talked out in the House in the course of an afternoon. There can have been no expectation that fundamental differences of opinion coincident with party lines would be expressed by the Prime Minister and the Leader of the Opposition, but all were anxious to learn, if possible, what Mr. ASQUITH and Mr. BALFOUR might think about the reports of the Royal Commission, for the appointment of which the latter was responsible. The result was not disappointing, except perhaps to those who pictured to themselves at least a forecasting of the speedy "breaking up of the Poor-law" and a unanimous condemnation of the much-abused boards of guardians. The Premier, the Leader of the Opposition, and the President of the Board of Trade all spoke, and the essential quality of their speeches was that of moderation. They deprecated the setting up of the one report against the other, and the advocacy of the views of the Majority or of the Minority expressed in catch words and phrases, or, as Mr. BALFOUR expressed it, in "labels." They were careful to point out how much the two documents have in common, but at the same time they refrained from any suggestion that proposals for legislation founded on opinions expressed in both would necessarily meet with their approval. They were in accord as to the importance of the subject, which, as they pointed out, was far beyond the possibility even of superficial treatment in the course of a single afternoon at the invitation of a private member, and they treated the matter in accordance with a phrase of Mr. BALFOUR, who said early in his speech: "All you can say is that a debate of this kind has great uses in giving honourable Members an opportunity of expressing their various points of view, in bringing the whole subject before the country, and in giving the Government an opportunity, I will not say to pronounce on this great question, but to put some of the most important considerations which should be borne in mind before the House and before the great and increasing body of public opinion outside this House which takes an interest in this vital social question." The services done in the administration of the existing Poor-law by the boards of guardians, and the progress achieved in recent years by the Local Government Board as the central authority came in for commendation on all sides.

Mr. JOHN BURNS made some especially significant observations upon the improved treatment of the poor and upon the results accruing from it under the existing system, for which he claimed credit not for the guardians only, or for his department, but for the community as a whole. He also acknowledged that he had taken during the last few months what was "good, sane, and practical" in both the Majority and Minority Reports and had tried to apply it to the great problem with which he had to deal. Mr. BURNS also, like several of those who preceded him, including Mr. BALFOUR and Mr. ASQUITH, referred to the serious question of the increased, and not ascertained, expenditure necessarily involved in the Bill before the House, and in any drastic change in Poor-law administration. Altogether the outcome of the debate was the recommendation of caution and of the improvement of detail introduced with the aid of existing machinery. There was no eagerness shown for the "scrapping" of the old machinery without waiting to estimate the price and efficiency of that proposed to replace it. Additional interest is lent to this possibly unexpected feature in the debate by the recent publication of a proposal in outline for the utilisation and adaptation of existing Poor-law areas and boards of guardians, the author of which is Mr. CHARLES BOOTH. Mr. BOOTH, it will be remembered, retired from the Royal Commission before its proceedings were concluded, but was specially thanked by his colleagues in their report for a most valuable body of statistics which, at his own expense, he compiled for their information. An interesting feature in his present suggestion lies in the fact that he expresses himself in accord with Dr. ARTHUR DOWNES who, although he signed the Majority Report, stated his mistrust of the drastic changes of administration proposed by it in a memorandum which followed it. In that document he questioned the wisdom of the abolition of directly elected *ad hoc* authorities and the substitution for them of bodies largely independent upon public election; and he also suggested that the areas proposed for the new Public Assistance Authorities would be in many instances insufficient to enable them to carry into effect the classification of the objects of their care. Dr. DOWNES, in that memorandum, expressed himself as indebted to Mr. BOOTH for many of the figures upon which he founded his opinions. And Mr. BOOTH, in his introductory observations, refers to his own opinions as being shared by Dr. DOWNES. Mr. BOOTH'S scheme has for its motive the retention of directly elected

authorities for the relief of destitution operating in areas sufficiently large to permit of classification of separate institutions. In order to obtain this he would retain the present parish areas as the units of each union, and group the existing unions under district Poor-law boards. In these boards he would distinguish between urban and other groups of unions, for in the former case he would recommend the use of existing union areas as electoral districts for the board, and in the latter would have each union in the group represented on the board by its chairman or vice-chairman, and possibly by one other member. To these popularly elected members in both cases (urban and non-urban) he would add nominees of the Local Government Board in numbers proportionate to the Exchequer grant enjoyed by the district.

We have here a proposal consistent with the utilisation of existing machinery and involving no very great departure from established methods, but at the same time providing facilities for improved administration controlled by directly elected representatives of the ratepayers. It has against it two formidable competitors in the schemes propounded in the Majority and Minority Reports, but there is no evidence of the leaders of any party in Parliament having any marked desire to put forward and support either of these or even a combination of the two. On the question, however, of the direct election of guardians of the poor as a separate authority we may refer our readers to the adverse opinions to be found in the Majority Report (Part IV., Chapter II.) based upon the small amount of interest shown by the electorate and upon the difficulty of obtaining as candidates the best men and women available. In the circumstances, when we consider the vastness of the interests and the complexity of the questions involved, we should regard it as satisfactory that there is no likelihood of drastic changes being initiated hastily and without due consideration. On the other hand, if we have not seen any scheme propounded as yet which approximates very closely to the new and reformed system which we may expect future generations to enjoy, we may yet anticipate the extension of the work of the existing boards of guardians and of other agencies in various directions with beneficial results, credit for which will be due to the Majority and Minority Reports of the Poor-law Commission. There is no need of drastic legislative change, for example, in order to secure desirable reform in many matters relating to the care of the sick. The just claims of the Poor-law Medical Service demand attention and need not wait for the constitution of new Poor-law authorities before they are considered. Moreover, these claims are not the selfish demands of individuals for emoluments and personal advantages, but are based upon the desire of a body of public officials of great and increasing importance to see their good work in the past recognised and its efficiency in the future, according to modern ideals, ensured. We would point out that the improved treatment of the sick poor inside and outside the wards of Poor-law institutions has not been inspired by boards of guardians or by the force of public opinion, although the latter has, no doubt, supported the medical profession. It has been the outcome of the zeal of those who have been engaged in the Poor-law Medical Service and of the progress of medical science.

The Localisation of Cerebral Function: the Goulstonian Lectures.

RECENT years have seen very considerable advances in our knowledge of cerebral function and its exact localisation, and the thought of the days when the phrenologist placed philoprogenitiveness in the cerebellum and associated linguistic talent with prominence of the eyeballs only provokes a smile. Yet the impression left by a perusal of the elaborate and painstaking researches embodied in the Goulstonian lectures of Dr. J. SHAW BOLTON of the Lancaster County Asylum, lectures which represent 14 years of patient labour, is not so much one of wonder at what has been accomplished as almost of dismay at what remains to be performed. Dr. BOLTON'S modesty leads him to describe his work as unsatisfactory and incomplete, but these lectures, as a contribution to the study of cerebral function, will assuredly be of permanent value, and form a notable addition to the productions of English neurology.

The work, commenced as long ago as 1878 by BEVAN LEWIS and HENRY CLARKE, of differentiating the cerebral cortex on histological grounds, has been very distinctly advanced by A. W. CAMPBELL and by BRODMANN, and now no text-book of neurology is complete without a map of the cortex in which areas which differ in histological characters are clearly marked off from each other. It is true that unanimity in this task of delineation has not been reached, although the main features of the cortical map have been established. This is partly to be attributed to personal differences of opinion in the matter of subdivision, and partly to differing methods of describing the cell lamination of the cortex. Dr. BOLTON has taken as the basis of his work the division of the cortex into five primary laminæ, as follows: (1) the outer fibre lamina or superficial layer; (2) the outer cell lamina or pyramidal layer; (3) the middle cell lamina or granule layer; (4) the inner fibre lamina, which in certain regions contains such bodies as the Betz cells and the solitary cells of Meynert; and (5) the inner cell lamina or polymorphic layer. To take a single illustration of how these layers differ relatively in various parts of the surface of the hemispheres, the third layer is almost wanting in the cortex of the ascending frontal, pre-Rolandic, or precentral convolution, whereas in the occipital region it is of great depth and is even duplicated. Such a distinction inevitably leads to the suggestion that it may correspond to difference of function, and this, baldly stated, is the problem with which the investigator is faced. Only those who have a first-hand acquaintance with cerebral histology can form any true idea of the immensity of the task. Before it can be entered on at all it is essential to have a uniform method of measuring the layers of the cortex, and it is necessary to define the exact regions of the cortex which are capable of measurement. Dr. BOLTON takes micrometric measurements of the cortex of any given area in four places—viz., on the flat surfaces of convolutions, at the apices or fissure lips, at the bottoms of fissures, and on

the sides of fissures. Measurements taken at these four spots he unites to obtain an average, and only then does he consider himself in a position to compare the cortex of one part of the brain with that of another, or of one case with that of another. The question of individual differences obtrudes itself ere any satisfactory comparison can be made, and Dr. BOLTON is convinced that both in projection areas of stable organisation (such as the so-called motor area) and still more in specialised regions of association (for example, the prefrontal area) such differences may be very considerable. The next step is to determine by these micrometric methods the manner in which the lamination of the cortex is evolved. If the prefrontal cortex be chosen by way of example, it can be definitely determined that evolution proceeds from within outwards, and that the inner cell lamina approaches the adult depth at birth, at which date the middle cell lamina is about three-fourths and the outer cell lamina still little more than one-half of the adult normal depth. Further, it can be demonstrated with certainty that the evolution of the cortical laminæ is earlier in the occipital (visuo-sensory) area than in the parieto-occipital (visuo-psychic or association) area, and earlier in the latter than in the prefrontal or higher association zone.

Yet all this new and important anatomical and embryological investigation is but a preliminary to the development of Dr. BOLTON'S main thesis, which is, that the essential physical basis of mental disease consists on the one hand in a true subevolution, or defect of development, of the cell laminæ of the cortex, and on the other in degrees of decrease of the cell laminæ, which is of the nature of a true involution or dissolution. It is impossible to do more than merely indicate some general conclusions, based on the average measurements of 30 cases of mental disease, grouped under visuo-sensory, visuo-psychic, and prefrontal regions. Dr. BOLTON finds that a definite relationship exists between the depth of the prefrontal cortex of the respective cases and the degree of amentia or dementia which existed. No such relationship obtains in the case of the other two regions measured. Further, if we consider the individual cell laminæ, we find that Dr. BOLTON is led to the conclusion that the inner cell lamina is the fundamental cell layer of the cortex, and is concerned with the performance of the instinctive activities: it is below the normal depth in the prefrontal cortex of imbeciles and dements unable to attend to the calls of nature or to feed themselves; while the second or pyramidal layer is concerned with the psychic or associational, in contradistinction to the instinctive, activities of the cortex. In a case of well-marked dementia in a formerly intelligent adult, from the point of view of total depth the visuo-sensory cortex was normal, the visuo-psychic was reduced 6 per cent., and the prefrontal 13 per cent. From the point of view of individual laminæ the second or pyramidal layer was reduced 6 per cent. in the visuo-sensory area, 13 per cent. in the visuo-psychic area, and no less than 24 per cent. in the prefrontal area. Evidence is adduced from an examination of the cortex of other mammals to support the view of the function of the cortical layers mentioned above. In the precentral area the combined depth of the lower laminæ is practically the same in the rhesus as in man, and is one-fourth greater in the dog. On the other hand, there is a vast difference in the three cortices with regard to the evolution both in depth and in content of the outer cell or pyramidal lamina, which attains its maximum in man. The conclusion is that in organic and instinctive activities there is little between man, the monkey, and the dog, whereas the psychic, associative and educative functions of the former are paramount.

It will be seen that Dr. BOLTON approaches the problem of the correlation of structure and function from a novel standpoint, and has advanced a hypothesis of the function of the cortical laminæ which receives material support on both clinical and pathological grounds. It throws light on the vexed question of the physiology of the central convolutions and on many other matters of dispute, such as the relation of the intermediate precentral cortex to the precentral cortex. We are not able to follow Dr. BOLTON in all his contentions, and we may disagree with his interpretations of some of his facts. But this is not the time for minute criticism. However incomplete the lecturer may feel that his work is, he is to be congratulated on a most stimulating and suggestive contribution to the study of the localisation of cerebral function, conceived in a scientific spirit and carried out with consummate patience.

Deaths under Anæsthetics.

WE publish in another column the report of the inquiry into the question of deaths resulting from the administration of anæsthetics which has been made by the Coroners' Committee, to which Departmental Committee of the Home Office the matter was referred as an additional reference.[1] Most of our readers will probably agree with our view that the recommendations, which we are glad to say were unanimously adopted, are sound. They will undoubtedly help to protect the public in many directions. Some will feel that the report does not go quite far enough, and the difficult question of local anæsthetics has been treated with timidity; but as a whole it endorses substantially the views of the General Medical Council, and these were generally received by the medical profession as well-considered and wise. The General Medical Council, it may be remembered, adopted among others the following findings of its Anæsthetics Committee:—

> That it is desirable in the public interest that the administration of anæsthetics for the purpose of inducing unconsciousness or insensibility to pain during medical, surgical, obstetrical, and dental operations or procedures should be restricted by law to duly qualified medical practitioners, due provision being made for the practical instruction of students, and for cases of emergency.

And—

> That it is expedient in the public interest to provide that the person who administers the anæsthetic for the purpose of inducing unconsciousness during any medical, surgical, or dental operation or procedure should not be the person who performs the said operation or procedure, due provision being made for the cases of emergency.

It seems to us that in the first of these findings the Departmental Committee might have found complete justification if it had decided to limit the use of local anæsthetics to registered medical and dental practitioners. Upon the point where the greatest discussion has so far arisen—viz., the

[1] The main report was reviewed in THE LANCET of April 9th, p. 1909.

position of the dentists with regard to the administration of certain specified anæsthetics—the General Medical Council approved the conclusion that having regard to existing conditions it is desirable in the public interest that duly qualified dental practitioners should be authorised to administer certain specified anæsthetics, such as nitrous oxide gas, for the purpose of inducing unconsciousness or insensibility to pain during dental operations or procedures. The Departmental Committee takes the same view.

So that in the main principles laid down by the General Medical Council the report of the Departmental Committee concurs, while we are glad to see that the Committee definitely recommends that legislation should follow upon their report:—

As the law stands at present [they say] the administration of anæsthetics is under no regulation. Although a man cannot sell a glass of beer to another without a licence, he may drug that other person to his heart's content, without let or hindrance from the law. Apart from any criminal intent, a bone-setter, or a beauty-doctor, or a quack of any kind is as much at liberty to administer an anæsthetic to his patient for the purpose of an operation as a qualified medical anæsthetist. If an accident happens as a result of the administration, the fact that the person administering the anæsthetic was not qualified might, of course, be material as bearing on the question of negligence, civil or criminal. We think that this unregulated state of affairs constitutes a serious menace to the public, and that the administration of anæsthetics should be carefully regulated by law. We proceed now to consider the different classes of anæsthetics, and the regulations which in our opinion should be applied to them.

This expression of opinion, with which all medical men will be in agreement, brings the recommendations of the Departmental Committee practically into line with those of the General Medical Council, for, like the Council, it is strictly opposed to single-handed anæsthetising and operating except in cases of urgency. In connexion with the employment of nitrous oxide gas, the Committee expresses a strong opinion that the same person should not administer the gas and perform the operation, while they realise that this principle applies with increased force to such anæsthetics as chloroform or ether.

The last recommendation made by the Committee we would single out for special notice. It is an excellent idea that a small standing scientific committee should be appointed by the Home Office to deal with the subject of anæsthetics, their composition, their methods of administration, and the relative measures of security which can be obtained by such methods. That the administration of anæsthetics is not yet an exact science is proved by the conflict of medical opinion which is only too ready to arise when a question concerning anæsthetics is under debate, and the labours of a standing committee might clear up some of the disputed points. Again, the dangers arising from the improper administration of anæsthetics, if they have been exaggerated in some quarters, are very real—this is proved by the list of the fatalities, progressively increasing in number, supplied to the Committee by Dr. F. W. HEWITT. The Committee rightly refused to make absolute deductions from figures connected with widely varying circumstances, but it acquiesced in the important conclusion that a certain proportion of an increasing number of deaths under anæsthetics must be regarded as due to preventable causes. It would be the duty of a Standing Committee to inquire into all such fatalities and to arrange the information in such form that a proper statistical return could be made from which deductions of the most absolute kind could be drawn. We hope that legislation will quickly follow upon the lines indicated in the report.

Annotations.

"Ne quid nimis."

RAG-FLOCK.

WE have appealed again and again for an official system of control over the manufacture of rag-flock, which, as we have proved in a practical investigation, may be derived from the filthiest possible sources. The matter has now received the serious consideration of the Local Government Board, and the report just made to the Board by Dr. Reginald Farrar, which is supplemented by reports from Mr. Cecil Warburton, Professor G. H. F. Nuttall, Dr. G. S. Graham-Smith, and Dr. F. C. Garrett, amply justifies the terrible conclusions arrived at by THE LANCET Commissioners in 1907, 1908, and 1909. In an introductory note to the reports Dr. Newsholme says definitely that it is evident from Dr. Farrar's report that the existing conditions under which rag-flock is produced are far from satisfactory. The rags employed are of the lowest and cheapest grade. They consist generally of cast-off clothing and strips of old carpet which may have been picked out from refuse heaps, and although in the tearing machine much of the dirt is removed from the materials from which the flock is manufactured, a large quantity of dirt remains. Dr. Farrar estimates that from 70 to 90 per cent. of the flock used for bedding and upholstery is neither washed nor sterilised, and he finds it difficult to exaggerate in describing the filthy nature of the material. We quote one paragraph upon this point. "Old trousers," he writes, "often badly stained with urine and fæces, are among the commonest of the articles which I have seen pass unwashed into the tearing machine in many flock factories, and some of the other garments used are almost equally filthy." "Some manufacturers," he adds, "purchase old beds and work up the contained flock unwashed with freshly torn material," and "several foremen and workpeople who have been many years in the trade have assured me that they have not infrequently seen surgical bandages and dressings, and even sometimes stained 'towels' torn up unwashed for flock." Mr. Warburton reports that lice and (*a fortiori*) their eggs may pass through the flock-making machine without being crushed. Although the lice without food would probably not survive in the bedding made from verminous flock, yet the eggs may take a month or more to hatch, and "it is quite possible that living eggs might be present in bedding." Professor Nuttall and Dr. Graham-Smith record a number of bacteriological and pathological experiments, and cases are quoted of septicæmia set up in mice by inoculating them subcutaneously with untreated flock shoddy. They conclude, however, that it is impracticable to set up a bacteriological standard of the purity of flock. Dr. Garrett finds that there is no difficulty in discriminating between clean and dirty flocks by chemical analysis, the differences in regard to the figures for chlorine being very wide. On the question of a standard of purity Dr. Farrar suggests that if in the public interest a standard of cleanliness for rag-flock is prescribed, such a standard should be selected as can be, and is by

several manufacturers, attained with the employment of methods now in use, the application of which will not cause undue disturbance of trade. The standard should neither be so high as to be unduly difficult of attainment by the use of existing methods, nor so low as to encourage manufacturers to mix unwashed with washed flock while keeping within permissible limits. Dr. Farrar suggests that it would be reasonable to fix 10 milligrammes of chlorine in one litre of wash prepared on regulated lines, or 30 parts per 100,000 of flock, as the permissible limit of impurity. These interesting reports bring to light facts which can leave no doubt at all in the minds of all public health administrators that the sale of unwashed flock should be prohibited, and it is the immediate duty of the Local Government Board, we consider, to issue regulations which shall provide for the suppression of an offensive trade and a most insanitary state of affairs. Several manufacturers, notably Mr. T. R. Freeman of Monkton Coombe Mills, much to their credit and common sense, have begged for a long time for legislative control which would make this business clean. Until this is done flock produced on wholesome hygienic lines is handicapped because nasty offensive rags can be sold unwashed and unclean for the same purpose, but at an obviously cheaper rate.

DR. JOHN RUTTER AND THE LIVERPOOL MEDICAL INSTITUTION.

WE have received from Mr. T. H. Bickerton two pamphlets relative to the history of the Liverpool Medical Institution, the one being a historical sketch of Dr. John Rutter, the founder of the building, and the other an account of the various vicissitudes which the institution as an association has passed through up to the present time. The institution, as an association, was an amalgamation of the Medical Library, the Medical Institution, and the Medical Society, and after 1848 the Pathological Society also joined. For the building, which was inaugurated in 1835 and opened in 1837, the institution was fortunate in receiving a donation of £1000 and the site for a nominal rent from the corporation. The society continued to hold its land at the nominal rent, the lease having been granted by the corporation for 75 years from 1840, until in 1881 they applied for a renewal of the lease. The Lords of the Treasury, who had to be applied to by the corporation, decided that they could not give their consent to the application for renewal, which the corporation were quite ready to grant, the reason, if it be a reason, given being that the lease did not run out till 1915. In 1902 the trustees of the institution waited on the estates committee and were informed that the lease would not be renewed unless a fine of £817 4*s.* were paid. However, owing to the prompt action of the authorities of the institution, a history of the institution was printed and circulated drawing attention to the former action of the corporation in granting and being willing to renew the lease, and in 1904 the estates committee recommended that the trustees of the institution should be offered another lease of 75 years on payment of a nominal fine of 10 guineas. In this happy manner ended a most critical episode in the history of the institution. Of Dr. John Rutter, Mr. Bickerton says that he was only able to collect materials for a "fragmentary sketch." He was a cultivated, well-read man, a man of most generous and simple nature, and one, too, never weary in well-doing, but too modest and retiring to have left behind him material for a biography. A member of the Society of Friends, and born in 1762, he was educated in Edinburgh, receiving his degree of M.D. at the age of 24. He had studied in Edinburgh for but three years, but apparently he had served a medical apprenticeship in Liverpool from about the age of 16. His thesis is dedicated to his maternal uncle, William Brownsword, and dated "Edinburgh, the Ides of June (June 25th), 7th day, 1786." The date, be it noted, is somewhat confused; the Ides of June—i.e., June 13th—fell on a Saturday in 1786 according to Old Style, which, however, was done away with in 1752. Rutter, apparently wishing to give in addition the modern date, omitted the orthodox 11 days, making June 13th June 25th, in accordance with New Style, so that one of his dates is Old Style and the other New. Mr. Bickerton points out that Rutter's claim to fame was not so much his medical knowledge as his "recognising and advocating the means by which progress alone is possible—viz., education and coöperation." It was this idea which led him to the foundation of the Medical Institution as a place, to use his own words, from which, "as from a common centre, very interesting information affecting the welfare of large portions of the community may be diffused in every direction." It is interesting, too, especially at this time, to note that Rutter looked forward to the influence of the institution in enabling Poor-law medical officers to obtain a fair remuneration for their services. Such a man was John Rutter, and we are grateful to Mr. Bickerton for having put on record even the little information which he has been able, after much labour, to gather concerning him, for Rutter was one of those not uncommon in our profession who acted after the old canon, "What doth the Lord require of thee but to do justly, and to love mercy, and to walk humbly with thy God."

CEREBRO-SPINAL MENINGITIS IN BELGIUM.

WE have received a copy of an official report presented to the Minister of the Interior and of Agriculture of Belgium by Dr. M. Henseval and Dr. R. Bruynoghe of the Public Health and Hygienic Service dealing with the outbreak of cerebro-spinal meningitis in that country during 1909. The report reviews briefly the distribution of epidemic cerebro-spinal meningitis in the world and the history of its appearances in Belgium since the year 1859. After 1900 cases appeared more frequently, and during 1909 52 cases were reported distributed throughout the country, as shown in a map appended to the report. In a few of these cases, however, the diagnosis appears to have been doubtful. The number of cases attained its maximum during May, June, and July; 34 of the patients were children. 8 were adolescents, and 10 were adults. Only 19 of the cases were established as due to the meningococcus by bacteriological investigations; 6 of them occurred in one district and among persons closely associated together. Dr. Henseval and Dr. Bruynoghe discuss at some length the prophylaxis and treatment of the disease. They insist upon the importance of the healthy carrier of the meningococcus in the dissemination of the disease. They admit the laborious character of the bacteriological examination necessary to establish the fact that a given individual is a carrier, owing to the fact that organisms superficially resembling the meningococcus are often present in the naso-pharynx. They also admit the difficulty in securing isolation of carriers even when they are established and state that some authorities have regarded such measures as impossible of realisation, a view which they dispute, since they claim that in many instances it is possible to find the carriers and to quarantine them. They recommend that the patients should be isolated, by preference in a hospital, and that special care should be taken to protect children and young people from contact with patients or with carriers. They also advise that the linen and all objects soiled by the patients should be

carefully disinfected. The nurse should wear a long overall, to be removed on coming from the patient's room. The naso-pharynx of the attendants should be frequently rinsed with a disinfectant solution. Attempts should also be made to disinfect the naso-pharynx of carriers by means of insufflations of dried anti-meningococcus serum or of pyocyanase. They strongly recommend the use of anti-meningococcus serum in the treatment of patients suffering from the disease. In the Belgian cases it was used for 15 patients, of whom 10 showed successful results, in spite of the fact that in some of them the serum was not given as early as is desirable. Of the patients who did not receive any serum, 24 out of 36 died, and among those who recovered 1 became deaf, 1 was left with strabismus, and 4 continued to suffer from paraplegia after the acute stage of the disease had subsided. The method of treatment which Dr. Henseval and Dr. Bruynoghe recommend is the withdrawal of 20 cubic centimetres of cerebro-spinal fluid by lumbar puncture and the injection through the same cannula of 20 to 30 cubic centimetres of serum. This process should be repeated for three or four days or even more. Supplies of serum from the Rockefeller Institute at New York and from other sources were placed by the Belgian authorities at the disposal of any medical man requiring it for the treatment of cases of the disease. The report affords an indication of the interest shown in matters of public health in Belgium and is a noteworthy addition to the literature of the disease. The value of the anti-meningococcus serum is illustrated by a case recorded at p. 1068 by Mr. J. J. Weaver, with a note by Dr. Percy Marsh.

RABELAIS THE PHYSICIAN.

AMONG the world's most remarkable men must be included Rabelais, romancist, physician, and ecclesiastic. Few beyond the medical profession associate the author of "Gargantua" with medicine and surgery, and fewer still with the Church. In the *Journal des Débats* we read, "Un Comité vient de se constituer à Montpellier en vue d'élever à Rabelais un monument commémoratif de son passage dans l'antique et illustre Faculté de médecine de cette Université." In view of this interesting announcement it is opportune to recall briefly Rabelais's connexion with the healing art. Of the early days of "one of the few great humorists of the world," as Mr. Saintsbury terms François Rabelais, we have nothing but tradition, but in 1519 we know from a deed of conveyance that he was a Franciscan. Five years later, by an indult of Clement V., he changed his order and became a Benedictine. In the year 1530 his connexion with Montpellier can be traced, and he then appeared in public in the habiliments of a secular priest. From this time his name is inseparably associated with the city, and in the gallery of the former professors of the University his portrait finds its place. He then turned his thoughts to medicine and entered the Faculty of Medicine at Montpellier in September, 1530, and became a Bachelor in the November following. The next year he was lecturing on Galen and Hippocrates. In 1532 he was at Lyons acting as physician to the Hôtel Dieu with a yearly salary of 40 livres, and finding time to edit the medical "Epistles" of Giovanni Manardi," the "Aphorisms" of Hippocrates, and "Ars Parva" of Galen. In 1534 Rabelais accompanied Jean du Bellay to Rome as his physician. The authorities at Lyons Hospital considering that their physician had absented himself without leave appointed a successor, but, like a commitment order in our courts, the decision was "allowed to lie in the office" until his return. Before this took place he was again in Rome with Bellay, who was now a cardinal. In 1537 Rabelais took his doctor's degree at Montpellier, lectured on Hippocrates, and made a public anatomical demonstration. In the troublous times towards the end of the reign of Francis I., Rabelais was living in Metz and discharging the duties of town physician at a salary of 120 livres. During this time he was in needy circumstances, but after the death of Francis the clouds passed and, returning to France, he became "le curé de Meudon," as he is generally known among his own countrymen. From this time until his death, which is supposed to have taken place in 1553, Rabelais was engaged for the most part upon those literary pursuits which have made his name immortal. The Comité before referred to invite sculptors to submit models before the first day of May next. For the guidance of competitors the Comité states that it proposes to expend 30,000 francs (£1200) on the work. Considering the fame of Montpellier's professor, there should be no difficulty in obtaining funds for a more ambitious project.

DURATION OF THE INFECTIVITY OF THE GLOSSINA PALPALIS.

IN THE LANCET of Jan. 22nd we furnished our readers with an abstract of Sir H. Hesketh Bell's official report on the administrative measures which had been carried out in Uganda under his directions with a view to stopping the spread of sleeping sickness. Chief among these measures was the compulsory removal of the entire population at the end of 1907 from the fly-infected zone around the Victoria Nyanza to a new location some miles back from the shores of the lake. It was confidently anticipated that this drastic procedure would have the effect of causing a great diminution of the disease, if not its entire disappearance from the neighbourhood, since in the absence of natives with trypanosomes in their blood the glossina could not become freshly infected, and the formerly infected insects would naturally tend to die out in the course of time. Among the papers which have been presented to the Royal Society recently by the Sleeping Sickness Commission—of which Sir David Bruce, C.B., F.R.S., is the leader, and Captain A. E. Hamerton, D.S.O., and Captain H. R. Bateman of the Royal Army Medical Corps, and Captain F. P. Mackie of the Indian Medical Service, the co-workers—is one dealing with an investigation into the question of the duration of the infectivity of the glossina palpalis after the depopulation of the lake shores. When the inquiry was begun a period of two years had elapsed during which no native had been allowed to live or work within two miles of the Victoria Nyanza, except at a few cleared landing places, and as regards the population of the islands in the lake they had all been removed for some months prior to the commencement of the investigation. It is obvious that until it had been clearly ascertained that the flies had ceased to be infective it would be unsafe to permit the zone around the lake to be re-inhabited. For the purpose of testing the condition of the glossina as to infection 12 experiments were carried out by feeding on healthy monkeys a large number of flies caught on the shores of the lake. In only one instance, where the flies had been collected at or near one of the cleared landing places, was the result negative; but in the remaining 11 experiments with flies collected from the vicinity of the lake the disconcerting discovery was made that the glossinæ had still the ability to infect, and did actually transmit sleeping sickness in each instance to the monkeys. Sir David Bruce therefore concludes that glossina palpalis on the uninhabited shores of the Victoria Nyanza can retain activity for a period of at least two years after the native population has been removed. The investigators were not able to account for this apparently prolonged period of infectivity, but they discuss in their paper a number of possible explanations. Only two of these,

however, are regarded by them as needing further consideration, viz.: (1) that the duration of the life of the glossina is more than two years, and that, therefore, flies which became infected before the natives were removed are still alive and capable of transmitting sleeping sickness; or (2) that the mammals or birds along the shores of the lake have become infected and so act as a reservoir of the disease. As to this latter view there is at present no experimental proof, for the injection of the blood of shore-birds and mammals into susceptible animals has so far yielded only negative results. Sir David Bruce and his colleagues, in another paper read before the Royal Society, have shown that the proportion of infected flies to those which are not infected must be small, for by experiment it is seen that in artificially infected flies only 1 in 60 displayed the phenomenon of late infectivity. In nature the proportion, it is thought, must be considerably less, probably not much more than 1 in 1000. It appears to us that if infected flies can live two years or more, there would be advantage in instituting measures for the destruction of the tsetse flies in the zone surrounding the Victoria Nyanza. We are aware that Dr. Bagshawe, director of the Sleeping Sickness Bureau, has characterised attempts to reduce the number of these flies in any locality as "a labour of Sisyphus." In the light, however, of the facts reported by Sir David Bruce and his co-workers we think that fresh consideration might be given to the subject. In THE LANCET of Feb. 12th we drew attention to Maldonado's method for destroying these insects, and as the process appears easy and costs little a trial might, perhaps, be given to it with a view of attempting to get rid of the surviving infected glossina in and around the shores of the great African inland sea.

DUELLING IN ITALY.

THIS "method" or "relic" of barbarism dies hard south of the Alps. A discreditable scene in the Chamber of Deputies in which the good faith of military men and Members of Parliament, not excluding their female relatives, was called in question, drew down on the accusing orator (one of the Extreme Left) not only a shower of indignant protests, followed by fisticuffs in the lobbies of the House, but no fewer than four challenges to mortal combat. In the first of these the pistol as the weapon for vindicating offended "honour" was ruled out by the seconds and the sabre employed. Twenty-four assaults between the principals (General Fecia di Cossato and Signor Chiesa) took place, in the last of which the General was wounded and a welcome opportunity afforded for bringing the encounter to an end. Ultimately the General and the civilian (the latter, as usual on these occasions, having proved the superior fencer) were reconciled, embracing and kissing each other in true Southern fashion; while the three "hostile meetings" still to come off were cancelled as the result of "amicable arrangement." The incident has demonstrated once more the absurdity of the duel—doubly absurd in a nationality which prides itself on its respect for humans life, even to abolishing capital punishment, but yet look calmly, even approvingly, on when two men, of high social or official standing, deliberately attempt to shoot or sabre each other. What chance is there for the crusade against the "accursed knife," the weapon of the poor, when the upper ten thousand freely resort to the pistol or the sword, under the formal conditions of "seconds" and "umpires," always with lethal intent—often, too, with lethal effect, as in the case of poor Felice Cavallotti, "the Shelley of Italian statesmen"? In truth, the better mind of Italy has at last intervened to put a stop to the practice, and committees of all ranks and of both sexes have organised a movement which, by making the duel a criminal offence, will bring Italy into line with her more civilised sisters, while making her consistent with herself in abolishing "capital punishment" not only on the scaffold but also on the greensward.

SOCIETY OF MEDICAL OFFICERS OF HEALTH: A PRESIDENTIAL ELECTION.

FOR the first time, we believe, in the history of the Society of Medical Officers of Health there has been more than one candidate nominated for the position of President of the society. At the election which took place on April 8th six Fellows of the society were nominated for the office. They included Dr. A. K. Chalmers, Glasgow; Dr. F. G. Crookshank, Barnes; Dr. T. Eustace Hill, Durham; Dr. E. W. Hope, Liverpool; Dr. W. G. Willoughby, Eastbourne; and Dr. J. T. Wilson, Lanark. After some discussion as to the method of election, which according to the articles of association of the society must be by ballot, the names of all the candidates but Dr. Crookshank and Dr. Willoughby were withdrawn, and the latter was elected by 55 votes against 29 given to Dr. Crookshank.

RECURRENT INTRACRANIAL PSEUDO-TUMOUR.

A SHORT time ago we published an annotation on certain cases of so-called pseudo-tumor cerebri, of which the clinical features were indistinguishable from those accepted by all as characteristic of intracranial neoplasms, but where subsequent pathological examination failed to reveal any trace of the latter. As the simulation of spinal tumour by a localised serous meningitis is now, especially since the work of Sir Victor Horsley, more widely recognised, it has been suggested that some such condition may account for at least a section of these intracranial cases, the clinical importance of which we do well not to under-estimate. The latest number of the *Neurologisches Centralblatt* contains a paper by Dr. Heinrich Higier of Warsaw on a seemingly unique case of this description, where the symptoms disappeared entirely, and after an interval of 13 years appeared again, to disappear completely once more. There came under the observation of Dr. Higier in 1893 a Jewish boy, aged six years, who complained of paroxysmal headache, vomiting, giddiness, and attacks of transient blindness; he also suffered from typical attacks of Jacksonian epilepsy beginning in the right great toe, and from paræsthesiæ on the right side of the body. On examination there was right-sided hemiparesis, with diminution of sensibility, and a right ankle clonus; there was also paresis of the left sixth cranial nerve, and pronounced double optic neuritis. Antispecific treatment was followed by no observable amelioration; but after about six months the symptoms gradually disappeared one by one, and no trace whatever of disease was left. In 1904 the youth was in perfect health, and had been so for ten years. In May, 1906, after a trip to London, he began to complain again of diffuse headache, lassitude, vomiting, and uncertainty in walking. He was found to have again a right-sided hemiparesis, with exaggerated deep reflexes and an extensor response, and marked double optic neuritis with diminution of visual acuity. Nystagmus, intention tremor, and sphincter impairment were all absent. Antispecific treatment was energetically applied, but without avail, and an exploratory operation was proposed. Nevertheless, in December of the same year, for an unexplained reason, the symptoms slowly but steadily diminished in intensity, and in less than three months the sole indication of any intracranial disease was residual pallor and fluffiness of the optic discs. In June, 1909, the patient reported himself in robust health. Of various possible diagnoses that suggest themselves for this case there is none that is satisfactory, although the writer passes several in careful review. One or two somewhat

analogous cases are to be found in the literature, notably one by Hoppe, where the results of a necropsy proved to be negative. It is not, of course, permissible to entertain the idea of intracranial pseudo-tumour if the effects of syphilis, tuberculosis, severe anæmia, accident, and so on, cannot be excluded, or if encephalitis or hydrocephalus can be diagnosed, or if any subsequent pathological examination is incomplete. It is precisely this differential diagnosis of hydrocephalus or encephalitis that is often so fraught with difficulty, for these conditions sometimes simulate tumour closely, and if in addition chronic serous circumscribed meningitis of the cerebrum turns out to be substantiated it may be, according to Dr. Higier, that pseudo-tumor cerebri will become a pseudo-diagnosis.

OCCUPATION MORTALITIES.

IN a recent number of the Transactions of the Scottish Faculty of Actuaries[1] there appears a paper by Dr. James C. Dunlop, of the General Register Office, Edinburgh, on the influence of occupation on mortality, in which he has endeavoured to elaborate the observations contained in Part 2 of the supplement to the 65th annual report of the English Registrar-General. In an introductory note an interesting account is given of previous investigations on occupation mortality in this country, from the first essay by Dr. Farr in 1865 down to the most recent essay by Dr. Tatham in 1908, the latter work being justly characterised as "the most important contribution to the subject which has yet been published." For comparison with these reference is usefully made to the researches on the same subject by Dr. Bertillon of Paris (1889–95), and to those recorded for Switzerland in the Swiss Bureau de Statistiques (1871–90). In an essay expressly written for scrutiny by actuarial experts the author appropriately discusses the probability of error from paucity of data, as well as the limitations inseparable from statistical investigations of this kind, giving particulars of the methods adopted by him in dealing therewith. Referring to his own work on occupation mortality in Scotland, based on the population of 1901, and on the deaths in that year and in the years respectively preceding and succeeding the census, Dr. Dunlop endeavours to justify his departure from the expedient adopted in previous Scottish and English reports for measuring differences in the healthfulness of occupations —viz., that of computing for each of them the comparative mortality figure, his contention being that "the Scottish numbers were too small, and the consequent error too large to warrant such concise deduction." In place of this method the probable errors of the death-rates have been calculated and the several occupations have been arranged in six groups according as their corrected death-rates corresponded to or differed from the general rates of males in each of two periods. In addition to the foregoing Dr. Dunlop has used in this paper two other methods of comparison—viz., (1) the expectation of life in each occupation and (2) the probability of reaching the age of 65 years. As regards the exceptional value of the life-expectation method for comparative purposes there is practical agreement among vital statisticians. On the other hand, if we may judge from the experience of Somerset House, the comparative mortality method still in vogue on this side the Tweed would seem to have practical advantages not possessed by other and more complicated methods. In the course of his pamphlet Dr. Dunlop gives the principal particulars of the mortality observed in the more important occupations. For specified reasons he abstains from comment on the diseases causing this mortality, but, inasmuch as this information has already been given in the last supplement of the English Registrar-General, the omission is not a serious one. What constitutes the most interesting feature in the present work is the fact that the experience of France and of Switzerland is frequently laid under contribution for comparison with that of Scotland and England, and this alone would have fully justified its publication. As before stated, the selected occupations are here arranged in six groups. Comparing the first group with the last, we note that the first or healthiest group contained the chief professional occupations—e.g., the clerical, the legal, and the medical profession. The exceptional healthiness of the clergy is everywhere accepted as an established fact. They enjoy the highest expectations of life, and the highest probability of attaining the age of 65 years. In all the English and Scottish studies, as well as in the studies of France and Switzerland, the clergy have invariably been credited with a remarkably low death-rate. Lawyers also would appear to be a very healthy group. Their life expectation exceeds that of the general community by 2·7 years. Their probability of reaching the age of 65 is more favourable than that of other men, and so is their comparative mortality figure. Although, according to Parisian experience, lawyers enjoy fairly long lives, Swiss experience, on the contrary, shows them to suffer a higher rate of mortality. According to Scottish experience, the medical profession suffer a mortality somewhat in excess of that of other men. In Paris the death-rates of our profession are low, whilst in Switzerland, on the other hand, the reverse holds true. In the last or sixth of Dr. Dunlop's groups are included several occupations of a casual or intermittent character which are calculated to offer refuge to the derelicts of other occupations. To this fact, rather than to the hazardous nature of employment, is to be attributed the heavy mortality experienced by those included in this group. In Group 6 are classed coal-heavers, messengers, dock labourers, costermongers, and general labourers, all of which experience a death-rate greatly in excess of the average, and their expectation of life is less than that of other males by from two to eight years. General labourers are the most unfortunate of all; their expectation of life at age 25 is only 28 years, and is therefore in defect of the average by more than nine years.

[1] Transactions of the Faculty of Actuaries, vol. v., Part I., No. 45. London: Layton and Sons.

COMPARATIVE STRENGTHS OF SOME COMMERCIAL SOLUTIONS OF EPINEPHRIN.

EPINEPHRIN, the active principle of the suprarenal glands, is marketed under various names in the form of a solution, but clinicians hold conflicting views regarding the size of the dose necessary to produce a given physiological effect. In some cases negative results have unexpectedly been obtained, and as a consequence a certain amount of distrust has arisen regarding the effectiveness of some solutions of the drug. A series of quantitative studies of the relative physiological activity of some commercial solutions of epinephrin has been conducted by Dr. W. H. Schultz,[1] who found that of the seven different brands of epinephrin examined only three possessed an activity that equalled the standard. The method of comparison adopted was based on a previous investigation which showed that a pure sample of epinephrin furnishes a trustworthy standard in assaying vaso-constrictor substances. A solution of the pure base was prepared in the laboratory, showing but a trace of colouration and possessing a maximum physiological and optical activity and keeping properties that met all the requirements of a standard.

[1] Bulletin No. 61, Hygienic Laboratory, United States Public Health and Marine Hospital Service, Washington, D.C., 1910, pp. 30.

From the data collected it seems that the physiological activity of all epinephrin-like bodies can be assayed by the blood pressure method and their efficiency expressed in terms of the pure epinephrin base. It has been found that dogs yield the most constant and uniform results, the method used being that described in Bulletin No. 55 of the Hygienic Laboratory. Four of the seven brands of epinephrin solution under examination were found to vary from 3·75 to 71 per cent. of the required activity, those of weak strength being more or less worthless, and perhaps dangerous, from the physician's point of view. Some solutions, though showing a high degree of activity upon opening the original package, quickly deteriorated in spite of the extra precautions taken to guard against conditions known to further this process. Two of the solutions, adrenalin solution and supracapsulin solution, were found to be equal to the standard in activity. An examination of synthetic suprarenin solution showed it to be only one-half as active as the standard. The keeping properties of solutions of the synthetic substance are apparently very good when kept sealed in the original package, but not when diluted, even though kept under the most suitable conditions. This is shown by the rapid colour change and by an appreciable loss in physiological activity. Dr. Schultz made some preliminary experiments on the relation existing between the different shades of colour developed in solutions of epinephrin and their respective physiological activity. He found that the method of expressing the amount of colour in units of the ordinary colorimeter is unsatisfactory, for not only do the solutions develop different degrees of depth of colour, but more than one tint is involved. In the presence of sulphites and other deoxidising agents a solution may show but little colour, even when exposed to air and light, while at the same time it may possess but little vaso-constrictor action. In the absence of such abnormal conditions the strength of the solution is roughly in inverse proportion to the colour that usually develops in solutions of epinephrin upon standing. The colour is not always a safe criterion by which to judge the value of a solution of epinephrin. The presence of a precipitate points to the probability of serious deterioration in activity.

THE INTERNATIONAL COMMITTEE FOR POST-GRADUATE COURSES.

IT will be remembered that during the Congress of Medicine last year at Budapest an international committee was formed for the promotion of post-graduate studies in different countries, largely through the initiative and organising ability of Professor R. Kutner of Berlin, secretary of the committee, and under the presidency of Dr. Waldeyer, also of Berlin. A set of papers has now been circulated containing information upon the work of the committee, from which we learn that the board of management includes, besides the two gentlemen we have mentioned, Professor Landouzy of Paris, Geheimrat Professor Dr. v. Rein (St. Petersburg), and Dr. F. W. Pavy, and that Dr. Pavy's British colleagues on the committee are Dr. W. A. Jamieson of Edinburgh, Fleet-Surgeon E. B. Pickthorn, with the addition of Sir Benjamin Franklin, K.C.I.E., and Sir Havelock Charles, K.C.V.O., specially for India. One of the papers contains the statutes of the committee, which define its objects and organisation. Amongst the former are included the collection of information concerning the facilities for post-graduate study existing in different countries, the exchange of eminent teachers for the purpose of giving instruction to foreigners on important new methods, the arrangement of conferences in connexion with international medical congresses, statistical work, and the promotion of study tours in foreign countries. (We published full details of the organisation of the committee in THE LANCET of Sept. 11th, 1909, p. 813.) The remaining papers contain respectively a list of questions to be addressed to the post-graduate associations in each country concerning the ordinary academic and clinical instruction on all subjects of the medical curriculum available therein, the legal regulations for the courses of study and examinations, and the organisation of systematic instruction for military surgeons. A further list of questions asks for detailed particulars concerning the post-graduate courses in existence, the fees requisite for their use, and so on. The final paper contains the agenda for an extraordinary meeting of the committee which is to be held during the centennial celebration of the University of Berlin. They deal with the coördination of the information which will result from the committee's inquiries and the possible alteration of the lists of questions to be circulated, the organisation of an international information bureau concerning post-graduate facilities in different countries, and the amount of the subscriptions to be contributed by individual countries to the international committee, which we imagine will not be on a uniform scale. The office of the committee is situated at Kaiserin Friedrich-Haus, Luisenplatz 2–4, Berlin, N.W. 6.

THE ARTHRITIC DIATHESIS.

AT a meeting of the Academy of Medicine of Paris on March 8th last Sir Dyce Duckworth read a paper entitled "Étude Clinique sur les Particularités de la Diathèse Arthritique." He referred mainly to the arthritic diathesis in relation to gout, which he regarded as an endogenous malady following in the course of errors of metabolism in subjects disposed to "arthritism," and to neurotic manifestations in certain phases. He referred to the characteristics of the "gouty temperament," such as a tendency to urinary concretions, to asthma, and to eczema. He also drew attention to the digestive peculiarities of gouty subjects, such as the inability to digest certain fruits, and the predisposition to gouty attacks after the ingestion of tomatoes, rhubarb, lemon, or acid wines. He also mentioned another phase of the subject which has been especially studied by French physicians—namely, the remarkable immunity of the arthritic constitution to tuberculosis. In the gouty subject the soil is particularly unfavourable, and if infection does occur the progress of the disease is slow and has a marked tendency to arrest with fibrosis and chalky formations. Sir Dyce Duckworth's paper is published in the *Journal de Médecine de Paris* of March 26th.

THE WORK OF THE PELLAGRA INVESTIGATION COMMITTEE.

Dr. Louis Sambon, in charge of the Field Commission of the Pellagra Investigation Committee, has sent to the committee from Bergamo, where he is making his headquarters, a short report of the proceedings. Dr. Sambon, accompanied by his assistant, Mr. Amoruso, left London on March 20th, and joined Captain Siler and Mr. Baldini, who were already in Italy. After communication with the secretary of the Pellagra Commission of Milan and interviewing those who were already working at pellagra, an excursion was made to Trescore, where the disease is said to be very prevalent. The cases were found along the course of a mountain stream, the Tadone, the bed of which teemed with the larvæ or pupæ of simulium. Some of these were collected and sent to Mr. E. E. Austen, who is acting as entomologist to the committee. Professor Balp and Dr. Perrico were at this juncture detailed by the Bergamo Pellagra Commission to assist the British Committee, and Dr. Perrico accompanied Dr. Sambon and

Mr. Amoruso to Brusaporto, while Captain Siler and Mr. Baldini went to Albano and Torre dei Reveri. At Brusaporto 84 cases of pellagra were found in a population of 1000, and Captain Siler reported numerous cases at Albano, but none at Torre dei Reveri. The countryside is sorely afflicted with typhoid fever, measles, and diphtheria, while in Albano rabies is said to be present.

SUCCESSFUL RESECTION OF THE INTESTINE FOR MESENTERIC THROMBOSIS.

IN the *Boston Medical and Surgical Journal* of March 17th Dr. E. A. Codman has reported what appears to be the ninth successful case on record of intestinal resection for mesenteric thrombosis. A man, aged 45 years, was admitted into the Massachusetts General Hospital on Oct. 21st, 1909. His illness began three weeks before with dull abdominal pain. The pain persisted in the upper abdomen on the left side. Acute exacerbations lasting about an hour occurred. The pain was increased by exercise and by eating. The bowels acted every day until the last three days. On admission the abdomen was full and somewhat rigid but not tender. There were a leucocytosis of 35,000 and a systolic murmur. On Oct. 23rd the patient was seized with severe pain in the left upper abdominal quadrant. The pain was constant, but attended with paroxysms lasting 10 to 15 minutes. After two hours the abdomen had the rigidity of peritonitis, the patient became intensely pale and covered with cold perspiration, and the pulse was rapid and thready. Perforation of some viscus into the general peritoneal cavity was suspected. Under ether an indistinct mass was felt to the left of the umbilicus. A 6-inch incision was made at this spot and much bloody fluid was found in the abdomen. Beneath the incision were two dark-red coils of small intestine, evidently in a condition of hæmorrhagic gangrene. A search was made for other areas of infarction, but none were found. Resection of the affected area was performed. Much difficulty was experienced in tying off the mesentery, which was œdematous and friable. As the upper part of the jejunum was affected end-to-end anastomosis was performed. For several days the patient was in a critical condition with a bad pulse, bloody diarrhœa, and hæmatemesis. Typical acute gastro-mesenteric obstruction developed and was relieved by lavage and change of position. The leucocytosis did not begin to diminish until 10 days after the operation. During convalescence there appeared to be some free fluid in the abdomen. The portion of intestine removed was 4 feet long, and its veins were thrombosed. The middle 2 feet were dark red, and a foot on each side was of doubtful vitality. About 214 cases of mesenteric thrombosis have now been recorded, of which 50 were operated on. Although the mortality of operation is very great it offers a better chance than expectant treatment. The diagnosis before operation is almost impossible.

REGIONAL AND MYOCLONIC CONVULSIONS.

ONE of the most distinctive and at the same time least known features of genuine epilepsy is the occurrence of jerks or jerk-like movements without loss of consciousness. While they are rarely complained of spontaneously by the patient, it is often found on careful inquiry that he has suffered from them for years, usually the first thing in the morning, or during the night, and particularly for a longer or shorter time before the first paroxysmal fit. According to Dr. L. J. J. Muskens of Amsterdam, who devotes an article to their consideration in *Epilepsia* for 1909, they are present in the early stages of the disease more frequently than any other minor symptom, and are indeed perhaps as common as the familiar frontal headache of the pre-epileptic period. Sometimes these jerk-like phenomena are all that is ever noted. They are either unilateral or bilateral, and affect some definite region of the body; sudden adduction or extension of one or both arms, and sudden flexion or extension of the trunk are the commonest. In no fewer than 103 out of 150 female epileptics, and in 82 out of 150 male, regional convulsions were present at some or other period of the disease. They correspond to what Sir William Gowers has described as multimuscular contractions, and are rarely localised in one muscle or part of a muscle. A comparison of their main clinical features with those described as myoclonus shows certain special points of similarity in the two, and leads to the conclusion that each should be considered a subtype of genuine epilepsy. A compensatory relation between regional convulsions and complete epileptic fits can often be discovered. It is very well known that healthy individuals on going to sleep or during the night often wake up with a sort of jerk, and on the other hand epileptics are often met with who suffer from sleeplessness brought on by a continual waking up from their sleep by repeated jerking movements. Why these times should be associated with the appearance of jerks and regional minor discharges we are at a loss to know. Sometimes the jerks occur with peculiar violence while the individual is dressing. In view of the curious indifference of the lay mind to this pathological condition until the major fits have established themselves, their early diagnostic significance ought to be impressed on the general practitioner.

LUMBAR PUNCTURE IN MENINGITIS.

ALL who have much experience in the treatment of children are agreed that lumbar puncture is frequently of great value in diagnosis, especially in cases of meningitis, and in the present issue of THE LANCET we print a careful paper by Dr. G. Stirling Landon on this subject, based on a large number of cases which he had observed himself. 50 of the cases were suffering from meningitis, and about half of these were tuberculous in nature. Four of the cases suffered from chronic hydrocephalus and four from acute poliomyelitis. There are some who regard lumbar puncture as dangerous, but if due care be taken the risks are slight, except when there is partial or complete closure between the cranial and spinal portions of the cerebro-spinal canal, and in this case the distended brain may be pushed down into the foramen magnum and a fatal result may ensue. It may also be mentioned that the risk of lumbar puncture is decidedly greater in cases of cerebral tumour than in cases of meningitis. The most important clinical characters of the cerebro-spinal fluid are its cytology and its bacteriology. In the cytology the most critical matter is to determine whether any leucocytosis is mononuclear or polymorph, for it may be said that if the effusion is polymorph in character the leucocytosis is probably caused by a microbic infection rather than by tubercle, though this rule is by no means without exception. It has been suggested that a polynuclear effusion may result from the irritation caused by the needle in making the lumbar puncture. If this be so, subsequent tappings would be vitiated. The most conclusive of all positive results which can be obtained from examination of the withdrawn fluid are furnished by a bacteriological examination. The fluid itself forms an excellent culture medium and by this means organisms may be discovered which would otherwise have been missed. In the cases of tuberculous meningitis the organisms were found in all the 14 cases which were examined for it. It may be said that while positive results in lumbar puncture, especially the identification of a causal organism, are of great value, with most of the tests negative results are of little importance. Too much must not be expected from lumbar

puncture in the way of treatment, but in a certain number of cases recovery was apparently due to its repetition. Dr. Landon's paper is of distinct value, and an extensive bibliography will render it easy for any reader to study the subject more fully.

THE OCCURRENCE OF ADVENTITIOUS SOUNDS IN THE NORMAL CHEST.

UNLESS the normal sounds heard on auscultation of the chest are fully understood errors in diagnosis are likely to occur. For instance, the breath sounds heard immediately below the clavicle on the right side instead of being of the usual vesicular nature may be blowing or broncho-vesicular in character, although no morbid condition is present; so also occasionally adventitious sounds may be heard which are not due to disease. In another column we publish a letter from Dr. R. D. Rudolf of Toronto on this subject. Dr. Rudolf read a paper at the Winnipeg meeting of the Canadian Medical Association in August, 1909, in which he pointed out that it is usually considered and taught that in auscultating the normal chest nothing should be heard over the respiratory tract but the breath sounds and the vocal resonance, and as a rule this is undoubtedly true. In many chests, however, on careful auscultation, especially during a full inspiration, there may be heard fine or even medium sized crepitations. They are probably due to the unfolding of partially collapsed portions of the lungs. In out-patient practice it is a common experience to find that many patients, especially women, rarely expand their chests fully. When shown how to do so, during the forced respiration crackles may at first be heard over the bases of the lungs. The same result is less commonly experienced in examining the apices of the lungs, and unless this fact be remembered the crackles first heard when the patient is told to "breathe deeply" may be mistaken for signs of early tuberculous infiltration. Dr. Rudolf rightly mentions, however, that these sounds are chiefly heard along the edges of the lungs, and especially just behind the cardiac notch. The fact that they readily clear up upon full respiration, the absence of causes of œdema, and the want of all symptoms and signs of respiratory disease usually make it an easy matter to recognise their true nature. If all children were taught to respire fully such signs would be very rare.

THE TREATMENT OF DRY ARTHRITIS BY INJECTION OF VASELINE.

ABOUT six years ago Th. Rovsing of Copenhagen treated two cases of dry traumatic arthritis of the hip by vaseline injections, with results of so favourable a character as to encourage him in the application of the same method to other forms of joint disease without effusion. His latest paper on this subject[1] summarises results obtained by the injection of sterilised vaseline into 35 joints, results which have been observed over periods of at least 18 months following the injection. These 35 joints correspond to a total of 30 cases, in 5 of whom two joints were treated. In one group of 7 cases of gouty arthritis and arthritis deformans (multiple symmetrical arthritis with swelling and exacerbations) the results were in the main disappointing; injection was followed by a recrudescence of inflammatory change, and the vaseline appeared to act as an irritant. Rovsing is disposed to think that the treatment is inapplicable to these types of arthritis, except in cases where all active inflammation has died out and a dry joint remains; and he says that when fluid is found in a joint of this (inflammatory) type by puncture vaseline ought not to be injected, but that if the joint yields no fluid a small quantity of vaseline, insufficient to distend the synovial capsule, should be introduced. A second group, comprising 19 cases, is labelled "traumatic dry arthritis"; this includes senile osteo-arthritis of the hip and knee, as well as chronic arthritis following upon definite injury or continuous overstress. Puncture of the joint in such cases discovered an absence of synovial fluid, and injection of vaseline produced almost uniformly good results. Rovsing accounts for this by suggesting that the vaseline takes the place of the absent synovial fluid as a lubricant. His success in these cases encouraged him to apply his method in four cases in which arthrotomy and arthrectomy were practised for the relief of chronic traumatic arthritis; here also he obtained good results. In many of his cases he claims to have diminished pain and to have increased the range of mobility of the joints treated. Sterilised yellow vaseline is used, in quantities varying with different joints; for the hip-joint 20 to 25 cubic centimetres, for the knee 10 to 12 cubic centimetres, for the shoulder about 15 cubic centimetres are recommended. The hip should be exposed by incision, and the temporo-maxillary joint needs a similar precaution; the knee and shoulder may be approached by direct puncture. A special form of trocar with cannula is used, which can be screwed on to collapsible tubes of vaseline; the use of this instrument enables the operator to ascertain whether synovial fluid is present within the joint before the injection is made. Similarly, if no blood flows through the cannula after puncture it proves that no vessel is opened and that vaseline emboli need not be apprehended.

[1] Annals of Surgery, December, 1909.

THE Surgical Section of the Royal Society of Medicine will hold a debate on the Present Position of the Treatment of Syphilis on Tuesday, May 10th, and Tuesday, June 14th, at 5.30 P.M. Mr. J. Ernest Lane will open the debate, and Sir Jonathan Hutchinson, Dr. Alexander Fleming, and Mr. Arthur Shillitoe are amongst those who have promised to take part. The debate will be held in the Botanical Theatre at University College. Gentlemen wishing to speak in the debate are requested to send their names as soon as possible to the honorary secretary, Mr. J. Hutchinson, 1, Park-crescent, Regent's Park, London, W.

THE Hon. Sir John Cockburn, K.C.M.G., M.D., will lecture to the Royal Sanitary Institute, 90, Buckingham Palace-road, London, S.W., on the Public Health Aspect of Food-supply in the Colonies on Wednesday, April 20th, at 5.15 P.M.

A LARGE sum of money has been placed at the disposal of a prominent official of the British Dental Association in order that that body may put upon a working basis a scheme of dental treatment which is to be national in its scope.

DONATIONS AND BEQUESTS. — Mr. Cedric Houghton of Colwyn Bay has left by will £500 to the Preston and County of Lancaster Royal Infirmary and £300 to the Chorley Dispensary and Cottage Hospital.—The late Miss Emily Miller has left a sum of about £15,000 for charitable purposes. Subject to the payment of duties, one moiety is to be paid to the North London Consumption Hospital and one moiety to Dr. Barnardo's Homes.—Under the will of the late Mr. Jacobus Bernardus Gelder, the Great Northern Central Hospital, Holloway-road, N., and the Association for the Oral Instruction of the Deaf and Dumb will each receive £1000. Subject to certain interests, the sum of £6000 is to revert to the Great Northern Central Hospital.—Mrs. Martha Sophia Webb has bequeathed £400 to Addenbrooke's Hospital, Cambridge.

REPORT OF INQUIRY INTO THE QUESTION OF DEATHS RESULTING FROM THE ADMINISTRATION OF ANÆSTHETICS.[1]

ON Saturday last the Departmental Committee on the Law Relating to Coroners, which a fortnight ago issued its report upon the general matters included in the reference,[2] issued a further report dealing with the whole question of deaths resulting from the administration of anæsthetics. It is signed by all the Commissioners, we are glad to announce, for many of the points which are dealt with have been the subject of acrimonious discussion. We print the report in full and comment in a leading article upon the unanimous recommendations.

DEATHS RESULTING FROM THE ADMINISTRATION OF ANÆSTHETICS.

To the Right Honourable Winston Leonard Spencer-Churchill, M.P., one of His Majesty's Principal Secretaries of State.

SIR,—1. Pursuant to the Secretary of State's letter dated December 24th, 1908, and in connexion with our inquiry into the law relating to coroners and the practice in coroners' courts, we, the undersigned, have investigated the question of deaths resulting from the administration of anæsthetics. Many of the witnesses, coroners and others, who were called to give evidence on the general subject of our inquiry, incidentally gave us useful information on the special question of anæsthetics. We examined, with particular reference to anæsthetics, three leading London anæsthetists, Dr. Hewitt, Dr. Dudley Buxton, and Dr. Silk; some eminent surgeons, as, for example, Sir Victor Horsley, Mr. Pepper, of St. Mary's Hospital, and Mr. Clinton Dent, of St. George's Hospital; physicians who had devoted special atttention to anæsthetics, namely, Sir Lauder Brunton and Dr. Waller; and leading dentists, namely, Mr. Matheson and Mr. Tomes. We also had the evidence of the Secretary of the Incorporated Society of Extractors and Adaptors of Teeth, Limited, Mr. Butterfield, and of a prominent member of that society, Mr. Bowen. Finally, Sir Donald MacAlister, the President of the General Medical Council, kindly attended our Committee and gave us the views of the Council, and informed us of the steps taken by them to make the study of anæsthetics a necessary branch of the medical curriculum.

2. Dr. Hewitt gave us the statistics, extracted from the reports of the Registrar-General, as to deaths under anæsthetics for the 40 years from 1866 to 1905. They rose from 5 in 1866 to 155 in 1905. In the year 1897 there was a sudden unexplained rise to 126 deaths as compared with 70 in the previous year. But, with this exception, there has been a steady progressive increase in fatal accidents during the period in question. According to a return* furnished by coroners for the year 1908, the deaths under anæsthetics reported to them amounted in that year to 235.

3. We desire to point out that no absolute deductions can be drawn from these figures. In the first place there is no duty imposed on anyone to report a death under anæsthetics administered for any surgical or medical purpose. There is therefore no guarantee that every such death is reported to the coroner, or even notified as such to the registrar of deaths. Secondly, there is an important distinction to be drawn between death *from* an anæsthetic, and death *under* an anæsthetic. For example, a person under an anæsthetic may die from the action of the anæsthetic, or from surgical shock, or from hæmorrhage, or from a combination of these or other causes. So again a person under an anæsthetic may die from some accident consequent on its administration—e.g., asphyxia through the tongue slipping back, or regurgitation of food. Without a detailed investigation of each case it is impossible to say how far the anæsthetic was or was not the cause of death, or whether it even contributed to it. Thirdly, we have no statistics to show the ratio between the number of operations performed and the number of deaths under anæsthetics. This much we know, that, thanks to Lord Lister and to the system of aseptic surgery, a vast number of operations are now undertaken with success which a few years ago no one would have dared to do, operations without which patients must inevitably die or linger out their lives often in great agony. Abdominal surgery and brain surgery are both quite modern developments.

4. Still, when all these sources of error are allowed for, we have the fact that there is an increasing number of deaths under anæsthetics, and that in the opinion of experts a certain number of these deaths are due to preventable causes. A certain number of deaths are inevitable, whatever the care and skill may be with which the anæsthetic is administered.

Anæsthetics, like all other poisonous drugs, act differently on different constitutions. The idiosyncrasy of the patient is a factor which cannot be eliminated. Again, a person may be suffering from disease, *e.g.*, the status lymphaticus, which a skilled examination may fail to detect but which may greatly increase the risk. But in the interests of humanity it is of the first importance that accidents under anæsthetics should be brought down to the irreducible minimum.

We think that every death under an anæsthetic should be reported to the coroner, but we do not think that the coroner should in every case be bound to hold an inquest. He should have a discretion to decline to hold an inquest when he is satisfied on inquiry that the anæsthetic was necessary and was administered with due care and skill. The certificate of death should always state that the deceased died while under an anæsthetic. We understand that it is the usual practice for the medical man in charge of the case to report the death to the coroner direct. This is obviously the most satisfactory procedure, but in addition we think that the registrar of deaths should be required to forward to the coroner particulars of all such cases of deaths under anæsthetics as come to his knowledge.

5. As the law stands at present, the administration of anæsthetics is under no regulation. Although a man cannot sell a glass of beer to another without a licence, he may drug that other person to his heart's content, without let or hindrance from the law. Apart from any criminal intent, a bonesetter, or a beauty doctor, or a quack of any kind is as much at liberty to administer an anæsthetic to his patient for the purpose of an operation as a qualified medical anæsthetist. If an accident happens as a result of the administration, the fact that the person administering the anæsthetic was not qualified might, of course, be material as bearing on the question of negligence, civil or criminal.

We think that this unregulated state of affairs constitutes a serious menace to the public, and that the administration of anæsthetics should be carefully regulated by law. We proceed now to consider the different classes of anæsthetics, and the regulations which in our opinion should be applied to them.

6. Anæsthetics are either general or local. Dealing first with the general respirable anæsthetics the administration of which produces complete unconsciousness, and always involves a possible risk to life, we strongly urge that it should be made a criminal offence for any person to administer them who has not professional qualifications, or is not acting under the personal supervision of a person so qualified. We consider that the public ought to have the guarantee of professional training, and the further guarantee afforded by the administrator belonging to a recognised profession, with a high sense of responsibility, and under the disciplinary control of the General Medical Council.

7. General respirable anæsthetics fall into two categories to which somewhat different considerations apply, namely, nitrous oxide gas on the one hand, and, on the other, anæsthetics such as chloroform, ether, ethyl chloride, and the like.

Nitrous oxide gas is available only for operations of brief duration, and is the anæsthetic largely used in dental surgery. It is a very safe anæsthetic, and its effects quickly pass off. It requires, however, skill in administration and a knowledge of how to deal with certain common causes of danger which may occur, as, for instance, that of the tongue slipping back. Registered dentists have always freely administered it without medical assistance. It would be impossible to deprive existing registered dentists of their right to use it for dental operations, and, as regards the future we do not think that the right should be interfered with. All such dentists have now to undergo a good preliminary medical

[1] Presented to Parliament by command of His Majesty. Cd. 5111. London: Eyre and Spottiswoode, Limited. 1910. Price 1*d*. Pp. 8.
[2] THE LANCET, April 2nd, p. 942; April 9th, p. 1009.
* See Appendices.

training, and, if provision is made that this should include a course of instruction in the administration of gas as a compulsory part of the training, we think that the public would be sufficiently protected.

8. One point we desire to emphasise. We have had evidence that many of the accidents which have occurred in connexion with the use of nitrous oxide gas occurred when the same person both administered the gas and performed the operation. We think that in no case should one person attempt both to administer the gas and operate. If a medical man is not employed to administer the gas, the dentist should have the assistance of another registered practitioner for this purpose. When the patient is a woman, it is obviously important for the protection of the dentist, as well as for the safety of the patient, that a third person should be present. Single-handed operations under anæsthetics have given rise to several false charges of assault. This, however, is a matter which can be better dealt with by a professional byelaw, than by direct legislation.

9. We have considered carefully the representations of the Incorporated Society of Extractors and Adaptors of Teeth, who urged their claim to continue to be allowed to administer anæsthetics. The Secretary of the Society in his evidence told us that his Society had obtained returns from its members which showed that in England there had been 1,249,167 administrations of general anæsthetics by members of the Society, with only one fatal accident, and in that case the anæsthetic administered was ethyl chloride; there had not been a single accident with nitrous oxide gas. We have, of course, no means of testing these figures; but, even if not wholly trustworthy, they bear strong testimony to the safety of nitrous oxide gas. Still, after giving due consideration to this evidence, we remain of opinion that the public safety requires the guarantee of a professional qualification. No doubt many members of this Society are skilful anæsthetists, but, short of recognising a purely voluntary and uncontrolled Society as a branch of the medical or dental profession, we do not see that it is possible to draw any distinction between a member of the Society and any other member of the public at large. As the Secretary admitted, if a member of the Society is expelled for malpractices, he can still go on practising as before. The dental profession is not a close one. Any one can enter it who can comply with its very reasonable educational requirements.

Moreover, we do not think that the prohibition of the use of general anæsthetics would inflict any hardship on the members of the Society, because we gather from the evidence that they are, to an increasing extent, voluntarily giving up the use of nitrous oxide, and are using in its place cocaine and other local anæsthetics.

10. Somewhat different considerations apply to the anæsthetics of longer duration which are required for the more serious surgical operations. For such operations ethyl chloride is occasionally used, but the anæsthetics mainly relied on are chloroform and ether or combinations thereof, with or without alcohol. When pushed to any extent they act directly on the respiratory centre and the heart, and a new element of danger is introduced. Both chloroform and ether have peculiar advantages and disadvantages. Chloroform is less distressing to the patient; he goes under its influence more quickly than under ether, the period of excitement is less prolonged, and as a rule the symptoms on recovery are less unpleasant. Greater immobility is also obtained, and this is sometimes important to the surgeon; but the margin between safety and danger is narrower. Ether, on the other hand, is very much safer as regards its effects on the heart and respiration. One witness went so far as to say that it was seven times safer than chloroform. But in many cases it is unsuitable. It is unsuitable for the very young and the very old, and for any persons who suffer from bronchial troubles. Sometimes chloroform is given in combination with ether, and sometimes chloroform is given first with ether to follow. Great responsibility rests on the anæsthetist in choosing the anæsthetic for a particular operation. He has to consider the patient's constitution and state of health as well as the nature of the operation, and the safety and comfort of the patient largely depend on the anæsthetist's skill and experience.

In connexion with the employment of nitrous oxide gas we expressed a strong opinion that the same person should not administer the gas and perform the operation. This principle applies with increased force to such anæsthetics as chloroform or ether. But in the case of urgent surgical operations we recognise that no hard and fast rule can be laid down. In cases of emergency, as for instance in the case of a railway or machinery accident, the medical man on the spot must do his best with such assistance as he can get. Dental operations requiring prolonged anæsthesia are never of such urgency that the presence of a medical man should be dispensed with. The accidents which may occur during the administration of these anæsthetics require full medical knowledge to deal with them. The anæsthetist must be always on the watch, and must be prepared to use artificial respiration, or even in extreme cases to resort to such an operation as tracheotomy. We are of opinion, then, that the administration of those anæsthetics the effect of which is of prolonged duration should be confined to qualified medical men.

11. The question of local or regional anæsthetics is more difficult. Many accidents have occurred through their administration, and they may be administered in many different ways. One form of administration, however, raises no doubtful issue. During the last few years the intra-spinal administration of stovaine or cocaine and its analogues has come into use. This method of administration is still in its infancy, and medical opinion is much divided as to the part which will be played in future by this form of anæsthesia. A certain number of fatal accidents have occurred, and in many cases distressing complications have supervened, and it is not always an advantage that the patient should remain conscious during the operation. Most of the experts who gave evidence on this question incline to the opinion that this method of anæsthesia would for a long time to come be confined to a very limited class of cases where there was great risk in administering a general respirable anæsthetic. Whatever may be the future of this new method, we think that it is perfectly clear that no one except a qualified medical man should be allowed to practise it.

12. The other uses of cocaine and its analogues for operative purposes raise a debateable question. Fatal accidents have from time to time occurred in the administration of cocaine, and many individuals appear to be peculiarly susceptible to its influence. It is undoubtedly a dangerous drug, especially in unskilled and untrained hands. Some of the witnesses before us were strongly of opinion that no one except a qualified medical man or a registered dentist ought to be allowed to practise this method of anæsthesia. But the balance of opinion among the witnesses seems to be against legislative interference, and with some hesitation we acquiesce in this view. Fatal accidents have not been numerous, and many of the objections to the use of general anæsthetics have no application to local anæsthesia. No restrictions on the use of local anæsthetics (except when used intra-spinally) appear to us to be practicable or desirable. Morphia (except as an adjunct) is rarely used for surgical operations, and much more harm is done by the self-administration of morphia than by any use that is likely to be made of it for operative purposes.

13. Having considered the restrictions which we think ought to be applied to the persons who are allowed to administer anæsthetics, we think that a good deal still remains to be done before fatal accidents from this cause can be reduced to a minimum.

In the first place, the administration of anæsthetics is by no means as yet an exact science, and a perfect anæsthetic has yet to be discovered. There is no consensus of opinion as to the choice of an anæsthetic or the conditions under which it is indicated. In Scotland, for example, chloroform is more freely used than in England. Again, we have heard somewhat conflicting opinions as to the depth to which the anæsthetic should be pushed. Some witnesses were of opinion that the way of safety lay in keeping the anæsthesia light, and that the anæsthetic should be pushed only to the point of abolishing pain; while other witnesses were of opinion that the anæsthesia must be profound, otherwise the danger of surgical shock was increased. The surgeon is between the Scylla of surgical shock and the Charybdis of paralysis of the vital centres. There is need yet for much careful clinical observation, controlled, if necessary, by physiological experiments.

Secondly, we think that both practical and theoretical instruction in the use of anæsthetics should be made an obligatory portion of the medical curriculum. The General Medical Council have recommended that all medical students,

before qualifying, should be trained in the administration of anæsthetics, and all medical schools and examining bodies are, we understand, now acting on this recommendation. We think an adequate course of training in anæsthetics should be compulsory. We fully recognise the very special qualifications and capabilities which go to the making of an expert anæsthetist. It is only by long experience, coupled with special aptitude, that a man can attain to that position, but careful instruction can do a great deal to diminish the dangers incident to the administration of anæsthetics.

We would further urge on hospital authorities the importance of keeping up in every way the status of the anæsthetists on their staff. As more attention is given to the teaching of anæsthetics, and an increased prominence is given to the position of the anæsthetists, we think that the general practice in the administration of anæsthetics would improve.

14. It has been suggested to us that in the case of deaths under anæsthetics the inquest should be held before the coroner with a skilled assessor, either in addition to, or in substitution for, the jury. We think it would be impossible to differentiate between deaths under anæsthetics and other deaths involving difficult and delicate and scientific inquiries which the coroner has to conduct. In building accidents and mine accidents, technical and abstruse questions are often involved, and coroners have sometimes voluntarily called in the aid of an expert as assessor. This practice, perhaps, might be formally recognised by law, but we think it would be unwise to attempt to go further. If, in any classes of cases, assessors were made compulsory, there would be the greatest difficulty in getting competent men anywhere outside of a few of the great towns. A coroner's inquest must always be a more or less rough and ready inquiry. It is important that the inquiry should be commenced without delay, and terminated with reasonable expedition. In many cases expert witnesses are of more assistance than assessors, because their cross-examination elucidates points which might otherwise be overlooked.

At the same time we fully recognise the importance of scientific investigation when death occurs under an anæsthetic in hospitals, infirmaries, and similar public institutions. But such an investigation, conducted by the authorities of the institution, ought to be held under very different conditions from those necessarily attendant on an inquest where the main question is, whether any one was to blame or not. The object of the investigation is to determine the precise cause of the accident, the conditions which predisposed to it, the means which should be adopted in the future to avoid such accidents, and the circulation of the knowledge so obtained to the medical profession. In some of the larger hospitals such investigations, we understand, are now carried out, and we trust that in the future they will be held as far as possible in every case of doubt and difficulty.

15. As we have already pointed out, much yet remains to be learnt about anæsthetics and their administration, and we think that the most hopeful way of advancing knowledge would be the appointment of a small standing scientific Committee or Commission to deal with the subject.

The functions of such a Committee would be—

(*a*) To collect information from all sources, and to digest it when collected.

(*b*) To report from time to time on any advance made by the discovery of new anæsthetics, or by improved methods of administration.

(*c*) To direct chemical, toxicological, or physiological researches for the purpose of testing new discoveries or elucidating doubtful points.

(*d*) To make their information available to the medical profession in a convenient form, and at small cost.

The Committee should be nominated by the Home Office.

The Committee would require funds to prosecute its work, and we think that the Committee ought to have a grant from public funds, as progress in the science of anæsthetics is a matter which deeply concerns the public at large. Each year the death roll increases and at any moment any member of the public may have to undergo an operation which involves the use of anæsthetics. Recent benefactions have put a considerable sum of money at the disposal of the medical profession for the purpose of research work, and a portion of that money might well be devoted to researches in connexion with anæsthetics. If this could be arranged the charge on public funds would not be considerable.

16. We may sum up our more important recommendations as follows:—

(1) Every death under an anæsthetic should be reported to the coroner, who, after inquiry, should determine whether it is desirable to hold an inquest or not.

(2) In the case of every death under an anæsthetic the medical certificate of death should specify the fact, whether the anæsthetic was the actual cause of death or not.

(3) No general respirable anæsthetic should be administered by any person who is not a registered medical or dental practitioner.

(4) Registered dentists should be confined to the use of nitrous oxide gas for dental operations, and should not employ the general respirable anæsthetics of longer duration.

(5) Intraspinal anæsthesia should be practised only by registered medical practitioners.

(6) Practical and theoretical instruction in the administration of anæsthetics should be an essential part of the medical curriculum.

(7) Such instruction in the administration of nitrous oxide gas should be an essential part of the dental curriculum.

(8) In the case of any death under an anæsthetic in a hospital or other similar public institution, there should be a scientific investigation into the actual cause of death conducted by the authorities of the institution.

(9) A small standing scientific Committee on Anæsthetics should be instituted under the authority of the Home Office.

We have the honour to be, Sir,

Your obedient servants,

M. D. CHALMERS (Chairman).
MALCOLM MORRIS.
H. H. SHEPHARD.
T. A. BRAMSDON.
W. H. WILLCOX.

J. F. MOYLAN (Secretary).

18th March, 1910.

ANNUAL REPORT OF THE MEDICAL OFFICER OF THE LOCAL GOVERNMENT BOARD.

II.[1]

Tuberculous Milk.

THE subject of tuberculous milk may be of such great importance in relation to tuberculosis in human beings that we shall devote the greater part of this, our final, notice to an extremely instructive paper on this matter, which is communicated by Professor Sheridan Delépine, director of the public health laboratory and professor of comparative pathology and bacteriology in the University of Manchester. Professor Delépine has devoted special attention to tubercle bacilli in milk since the year 1892, and in this connexion he has done a large amount of work for several of our large towns, especially for the city of Manchester. The experience thus gained has now been presented in a comprehensive report to the Local Government Board, and in this form it will be a useful work of reference.

Methods of Investigation.

Professor Delépine points out that although the presence of tubercle bacilli in tuberculous products may be ascertained by microscopical examination, by cultivation, or by inoculation, his researches have satisfied him that the first and the last of such methods are the only two which can be relied upon. As regards the microscopical examination, he thinks that, although it cannot be trusted in the case of mixed milk, it is nevertheless capable with certain precautions of yielding useful results in the case of the unmixed milk of single cows, and he furnishes some useful examples of failure in the case of mixed milk and success in the case of unmixed milks. Dealing with inoculation experiments, it was found that the subcutaneous

[1] No. I. was published in THE LANCET of April 9th, 1910, p. 1020.

inoculation of guinea-pigs on the inner aspect of the hind leg at the level of the knee, even with a small number of bacilli, produced very typical lesions, and it was shown, on a basis of some 90 preliminary experiments, that by the results it is possible to assess with a fair degree of accuracy the degree of infectiousness—for guinea-pigs—of the products employed for inoculation. With a view of establishing standards of virulence Professor Delépine subdivided the development of experimental tuberculosis into four stages, according to the number and situation of the tuberculous lesions which are visible to the naked eye at varying periods after inoculation with 1-20th of a milligramme of a pure culture of tubercle bacilli of moderate virulence, and he claims that by using animals of the same race, age, and weight, kept before and after inoculation under identical conditions, the factor of the natural resistance of the guinea-pig can be rendered almost constant. This is an interesting point. He finds that not more than 2 cubic centimetres of fluid can be safely injected into the leg of a guinea-pig, and it is his practice when testing milk for the presence of tubercle bacilli to use for each animal the sediment of 40 cubic centimetres of milk, which, as he observes, is a smaller amount than is taken by a child daily, and is about one-fifth of the weight of the experimental animal. It has been found that the oral administration to kittens of an amount of tuberculous cow's milk bearing the same relation to the body-weight was generally followed by tuberculosis, even when only a single dose was administered. Professor Delépine reminds us, however, that it does not follow that a child would be injured by the same proportional amount, although the danger of such infection is assumed, while he does not in his paper discuss the question of the communicability of bovine tuberculosis to man.

Sources of Tubercle Bacilli in Cow's Milk.

An instructive discussion on the cow's udder is contained in this paper, and there are some useful diagrams of these organs showing tuberculous affections of certain quarters. The several sources of the tubercle bacilli found in cow's milk are fully dealt with and the parts played in such production by muco-purulent discharges from the respiratory passages, by fæces, by urine, and by utero-vaginal discharges are passed in review. Professor Delépine concludes that by far the most important source of the tubercle bacilli is the cow's udder itself, and he has made some instructive investigations with the object of ascertaining how much milk might be infected by a tuberculous udder—a matter obviously of great administrative importance. It was found that one part of the tuberculous secretion could infect 100,000 parts of sound milk, and, although the dilution was carried no further, it seems not improbable that this milk diluted 1,000,000 times might still have been capable of infecting guinea-pigs. As, therefore, many cows with early tuberculous disease of the udder yield very large quantities of milk, the tuberculous milk may, when the milk of all the herd is mixed together, infect a very large quantity. Under these circumstances it is consoling to find that in the majority of cases when laboratory experiments showed that the mixed milk from a farm was capable of inducing tuberculosis, the veterinary surgeon was able to discover a cow amongst the herd with a tuberculous udder. At the same time Professor Delépine's investigations show the very great difficulty which obtains in detecting early tuberculous lesions of the udder by inspection and palpation alone, and the need for simultaneous bacteriological examination of the milk from the suspected udder is clearly demonstrated. In this part of the investigation some very useful data were secured by Professor Delépine by purchasing a cow suspected of having a tuberculous udder, and in the stable attached to his own house observing the changes which took place in the udder and the yield of tubercle bacilli in the milk.

Results of Investigations at Manchester.

A reference to some of the results which have been obtained by these many years of work in Manchester will serve to show the value, from an administrative standpoint, of investigations such as these. Of the 5320 samples of milk coming from the 12 different counties which supply Manchester 8·9 per cent. contained a sufficient number of tubercle bacilli to produce tuberculous infection. No part of the area supplying Manchester with milk appeared to be free from tuberculosis, but there were considerable differences in the cases of certain counties—i.e., from Cheshire, 9·9 per cent.; from Derbyshire, 7·5 to 12·1 per cent.; and from Staffordshire, 8·9 to 14·2 per cent. It is, however, necessary to note that these figures are not based upon the examination of equal numbers of samples in each case. But, whatever may be the real variations it is hopeful to find that, judging from the statistical data furnished, Manchester has succeeded by the use of the powers contained in the Manchester Milk Clauses in reducing the amount of tuberculous milk supplied from one of the counties which yielded the highest percentage from 16·1 per cent. in 1897–98 to 6·5 per cent. in 1907. Tuberculous lesions of the udder were found in one or more cows on at least 75 per cent. of the farms supplying tuberculous milk to Manchester, and it is probable that such udders would have been found more frequently except for the slowness of the bacteriological methods and the distance of some of the farms from Manchester.

These at present unavoidable delays enable farmers to remove tuberculous cows from their farms, and there is reason to believe that such removal actually took place in some 16 per cent. of the farms supplying tuberculous milk. It also seems, and this fact is of importance from a national point of view, that farmers who were formerly sending tuberculous milk to Manchester are now supplying the same nutriment material to other towns where there are no Manchester Milk Clauses, or at least no efficient administration of them. But Professor Delépine's investigations, if they are confirmed and accepted by other bacteriologists, appear to hold out a prospect that the delay necessary for inoculation experiments may be in some measure curtailed by improved microscopical methods, since, as we have already observed, Professor Delépine finds that by taking certain precautions it is generally possible by the microscopical method to determine rapidly whether tubercle bacilli are present or not—that is to say, in the unmixed milk obtained direct from the cow tubercle bacilli may be discovered in more than 90 per cent. of the cows yielding tuberculous milk capable of infecting guinea-pigs. The inference from this is, that a more general collection of unmixed milks is necessary in order to obtain more expeditious results. But, unfortunately, as Dr. Newsholme remarks in his introductory observations, the operations of the "Model Milk Clauses" are limited by financial considerations, and these, even in the case of a wealthy and liberal corporation such as that of Manchester, may result in the collection of only two or three samples from each of the farms supplying the city. If these Milk Clauses are to be fully effective they must go hand in hand with active sanitary administration in the district in which the milk is produced; and there can be little question that gradually those invasive powers possessed by certain large towns—amongst which is London—are stimulating the rural district councils, or at any rate the farmers, to the necessity for modernising their plant and their methods, and it would be little short of disaster were any administrative friction between the powers of the invading and invaded districts to result in curtailment of the excellent work which is being carried out.

Paratyphoid Fever.

A useful contribution to our still very imperfect knowledge of paratyphoid fever is made by Dr. William G. Savage, who furnishes a concise historical survey of this disease. The number of cases regarded as paratyphoid fever has markedly increased during recent years, and Birt, writing in 1906, referred to some 500 reported cases. Relatively few of these cases have occurred in this country, a circumstance which is generally attributed to the fact that the disease has not been sought for. Dr. Savage has recently endeavoured to obtain some idea as to the actual prevalence of the disease in England, and he has examined 200 samples of sera received from different sources. Of this number only 171 were from cases which were clinically typical of enteric fever. As a result of his investigations he found that from 3 to 3·5 per cent. of the cases of apparent enteric fever were cases of paratyphoid fever, a percentage which is in accordance with Boycott's results for this country. Attention was also directed to the prevalence of paratyphoid bacilli in human excreta, and in this connexion 53 specimens of excreta and 7 of urine were examined. But the result failed entirely to support a view that paratyphoid bacilli are natural inhabitants of the intestinal canal; they are apparently found only in cases where they have played a definite pathological rôle. Dr. Savage's further investigations suggest that epidemiologically paratyphoid fever bears no relationship either to swine fever or to outbreaks caused by meat ingestion.

THE BUREAU OF THE PERMANENT COMMISSION OF THE INTERNATIONAL CONGRESSES OF MEDICINE: MEETING AT THE HAGUE.

THE Bureau of the Permanent Commission of the International Medical Congresses, created at the Congress of Budapest, met at The Hague on March 29th and 30th.

The members of this Bureau are: Dr. F. W. Pavy for Great Britain (President), Professor Waldeyer for Germany, Dr. R. Blondel for France, Professor Müller for Hungary, and Professor Maragliano for Italy (Vice-Presidents), and Professor Wenckebach (General Secretary). Dr. J. Lucas-Championnière, as President of the International Association of the Medical Press, is also a member of the Bureau.

The agenda indicated that the Bureau would have to appoint a new general secretary, the holder of that office having resigned, and to discuss a certain number of questions relating to the definite regulations and constitution of the Commission, together with the principles that should be applied when organising future congresses, the first of these being the International Congress which is to be held in London.

The latter items of the agenda were the most important, and persons had been brought together who possess great knowledge concerning the preparation of congresses and whose counsels were likely to prove most useful. As a matter of fact, however, this part of the programme was almost entirely suppressed. It had been arranged that there should be three business sittings. The first sitting was devoted to a speech of welcome, to various formalities, to the introduction of the new general secretary, Professor Bürger, and, finally, to a long discussion raised by the Hungarian delegate, M. von Grosz. The object of this was to obtain the nomination as honorary members of Professor Wenckebach, who has resigned, and of Professor Waldeyer, who desired to resign. The rules, however, in no wise provide for the nomination of honorary members of the Commission.

Then followed a discussion on the rules of the Bureau, but it did not last long, and the settlement of the question was handed over to a subcommittee. Professor Wenckebach, the secretary, who was elected at Budapest, explained that he gave up the post because he lived at Groningen and could not attend with sufficient regularity to the labours of the Bureau which was situated at The Hague. He proposed that Professor Bürger should take his place, though this gentleman also does not live at The Hague, but at Amsterdam. The residential secretary at The Hague will be M. van den Haer. Professor Wenckebach handed to the members of the Bureau a copy of a pamphlet upon Medical Internationalism which had been prepared by Dr. P. J. Eijkman for the Association for the Promotion of International Relations (Bureau Preliminaire de la Fondation pour l'Internationalisme). At the same time it was announced that the Dutch Government proposed to give an annual subvention of 4500 florins towards the upkeep of the Bureau and its employees, and anticipated in the future the construction of a special edifice to house the institution. With a view of augmenting the resources of the Bureau it was decided that if the organising committees of the International Congresses found that there remained a balance in hand after they had settled all their accounts, a portion of this surplus should be devoted to the support of the Bureau.

A discussion as to what should be the title of the Bureau followed. Should it be called the Bureau of the Permanent Commission of the International Congresses of Medicine or the Permanent Bureau of the International Congresses of Medicine? The first title was ultimately adopted. As for the official language of the Bureau, the French language was unanimously adopted, a fact which on the morrow did not prevent the general secretary from speaking on several occasions in German.

The organisation of future congresses was then discussed, and a request to recognise Spanish as one of the official languages was rejected. Proposals to create a section of professional medicine to deal with ethical questions and points of medical practice, and to admit dentists who were not qualified medical practitioners, were likewise thrown out. In spite of the very ardent pleading of the general secretary, Dr. Blondel succeeded in securing the adoption of a motion to the effect that, generally speaking, the International Congresses of Medicine would only accept as members such persons as possessed a degree of doctor of medicine or such other diploma as conferred the legal right to practise medicine in the country where the testamur was issued.

In regard to the next congress (London, 1913) it was resolved to call the attention of the British organising committee to the fact that the majority preferred that the congress should meet during the first days of August. The German professors especially are all retained in their universities till the end of the month of July.

At the morning sitting held on March 30th the resolution of the subcommittee appointed to consider the mode of election of the Bureau and of the Permanent Commission itself was adopted. It was decided that the members of the Commission should be elected by their respective national committees for the duration of the entire period separating two international congresses. At the end of the congress, the members of each committee will hold a meeting and will elect a new delegate or reappoint their former representative. The new Commission thus created will meet at once and elect its bureau. Dr. Blondel proposed that, if possible, the president of the Bureau should be the president of the organisation preparing the next congress, or the delegate of the country where the forthcoming congress is to be held. By this means the interference of some person who was foreign to the work of the local organising committee would be avoided. This proposal was adopted.

The question of the relations between the Bureau and the International Association of the Medical Press was the subject of a long and very animated discussion. Dr. Blondel spoke on behalf of Dr. Lucas-Championnière, President of the International Association of the Medical Press, who was absent, and demanded that the communications from the permanent Bureau to the press should be made by the intermediary of the International Association of the Medical Press. Dr. Blondel urged forward the proposals formulated by the British Association of the Medical Press to the effect that the Association of the Medical Press should be entrusted with the organisation of all the relations between the press and the public. Professor Bürger and Professor Wenckebach were opposed to this proposition and declared that if it was adopted they would at once resign. Dr. Blondel in vain sought to modify his suggestion by limiting its action to such countries as possessed an association of the medical press. The General Secretary replied that he could not assume the responsibility of organisation if he was not at liberty to communicate directly to newspapers outside of the Medical Press. Dr. Blondel now sought to widen the basis of the discussion. He dwelt upon all the difficulties that would arise if the new Bureau about to be created was going to awaken justifiable mistrust. The organising committee in each country must be left to freely take what action they might deem necessary, for on these committees alone rests the responsibility of success or failure. Obviously the assistance of the press in such work is absolutely indispensable. The Bureau of The Hague should only be the depôt for the archives, the domicile of the general secretary, and the office for correspondence with the members of the Permanent Commission. But the mission of the Bureau, he thought, would prove sterile if it arrogates to itself the right to interfere with and direct the local organising committees or to restrict in any way their independence. The General Secretary doubted whether the International Association of the Medical Press was capable of taking any really effective action. Finally, Dr. Blondel's proposals were rejected.

Several other motions were brought forward. Among these was a very important report by Professor Waldeyer and Professor Posner on the manner in which the national committees were composed. Another motion was introduced by Dr. Blondel on the limitation of the subjects treated in the general reports presented to the congresses. Another proposal was made demanding that means should be organised by the Permanent Commission to consult the national committees before the final publication of the rules and regulations of the congress. Then there was the proposal made by the British Association of the Medical Press on the right the Bureau should possess of rejecting papers that were not original or of but little value.

All these proposals were set aside upon the statement that the General Secretary had not had time to study them. Professor Posner and Dr. Blondel protested that the members present, with the exception of the General Secretary, who had only been appointed the previous evening, were sufficiently experienced in regard to the organisation of congresses to take part at once in what would be a very useful discussion on matters all of which were very familiar to them. In vain it was pleaded that there was urgent need, in view of the forthcoming congress, to settle some of the points raised, and that while several competent men were gathered together good use should be made of their presence. It was pointed out that if these men had taken the trouble to come all the way to The Hague it was solely for the purpose of dealing with such questions. But under the action of the Dutch and the Hungarians all these proposals were simply handed in for the General Secretary to examine and draw up a report upon them which is to be submitted at a general meeting of the Permanent Commission. Thereupon the discussion was at once closed and, further, the sitting which had been announced for the afternoon was not held.

It is probable that the forthcoming meeting of the Permanent Commission will take place during the month of October. Dr. Blondel proposed that it should be held in London so as to be more readily able to come to an understanding with the local committee of organisation of the next International Medical Congress.

MEDICINE AND THE LAW.

Certificates of the Cause of Death and Future Legislation.

IN connexion with the subject dealt with in our recent article on the Bogey of Premature Burial[1] we have received a letter from a clergyman who points out that the unfounded rumours as to persons being buried alive might be prevented if medical practitioners were only to give certificates for the purpose of death registration after having examined the dead body. The suggestion is by no means a new one but the situation at present is as follows. The medical certificate given for the purpose of death registration in obedience to the law is not, as our correspondent seems to think, an attestation on the part of the medical man who signs it of the fact, but of the cause, of death. The recent Departmental Committee appointed to inquire into the law relating to coroners and coroners' inquests incidentally inquired into these two questions of premature burial and of certification of death so far as they might be deemed to come within the terms of its reference. On the first point the committee had before it evidence of the strongest character from Mr. A. J. Pepper to the effect that the popular scare with regard to premature burial is absolutely baseless. On the second it observes in its report that the general question of death certification is outside the terms of its reference, but proceeds to recommend in connexion with the law of coroners that a certificate should not be accepted from a medical practitioner unless it states that he has satisfied himself of the fact of death by personal inspection of the body. This recommendation it makes relevant to the subject of this inquiry by proceeding to advise that every death as to which a medical certificate such as it recommends is not given should be reported to the coroner. It will thus be seen that whenever the law is amended with regard either to coroners or to death registration the certification of the fact of death by a medical practitioner who has seen the dead body will in all probability be made compulsory. The certificates now given are regulated by an Act of Parliament passed in 1874, and are lawfully, if undesirably, given without inspection.

The Preservation of Dead Bodies with a View to Identification.

At a recent inquest held by Dr. F. J. Waldo as coroner for the borough of Southwark, it was stated that the body, that of a man found dying in the street from acute alcoholic poisoning, had not been identified. A description had been given by the police, and the jury was informed that this for the purpose of the identification of human remains was usually found to be more effective than photographs. At the same time, attention was called to the desirability of means being provided for the preservation from decomposition of the body itself in order to secure as far as possible satisfactory evidence with regard to it. At the conclusion of the inquest the jury in a rider to their verdict expressed the opinion that the London County Council should provide an apparatus by which unidentified bodies might be preserved either chemically or by refrigeration. In this connexion we note that Dr. Waldo in his annual report to the Common Council upon the work performed by him as coroner for the City of London speaks of the recent successful installation there of a Herscher's apparatus for the preservation of bodies by formalin, and informs the Common Council that it has already proved of service in ensuring identification. The first body for which it was used, that of a man found drowned, remained in it for four months, and at the end of that time was free from appreciable signs of decomposition and easily recognisable. This apparatus, installed by the Common Council, is, we believe, at present the only one in use in connexion with a coroner's court, although Section 93 of the Public Health (London) Act, 1891, enables the London County Council "to provide and fit up one or two suitable buildings" for the purpose in question. The Common Council of the City of London is to be congratulated upon having been a pioneer in this matter, and it is to be hoped that the London County Council may see its way before long to follow the example set. It expressed itself as unable to make any provision of the kind indicated as recently as January, 1909, but possibly when the results secured in the City are established it will be willing to reconsider its decision. The usefulness of an apparatus for the preservation of unidentified remains would be most readily tested in a waterside district, such as Southwark, owing, not only to the condition of bodies "found drowned," but also to the part which the river plays in crimes of violence, in suicides, and in accidental deaths.

[1] THE LANCET, March 19th, p. 803.

Looking Back.

FROM

THE LANCET, *SATURDAY*, April 14th, 1832.

THE CHOLERA IN PARIS.

SINCE the publication of the last number of our journal, the capital of France has been the scene of such melancholy events as will form one of the most gloomy pages in the history of pestilential diseases. Within ten days from its announcement in Paris, 7,000 cases of cholera have occurred, of which number 3,600 have terminated fatally. The mails received as we write, give the last *daily* report at nearly *two thousand* cases and *eight hundred* deaths within the twenty-four hours.

When it is remembered that this disease and mortality, enormous as they are, are but the amount of what has occurred in the city of Paris alone; and when it is also borne in mind that the scourge is raging with equal violence in all the *immediate suburbs* of the town, from which the cases are not reported; and, lastly, when it is taken into consideration, that at least one-third of the cases *in* Paris are not reported, as is the fact, a just idea may be formed of the overwhelming power of this almost unprecedented calamity.

If we ask ourselves,—What is the nature and what the laws which govern this anomalous pestilence?—how strange, how inexplicable are the facts we have to contemplate! In Paris, not five days before the onset of the disorder, M. VILLERME, the well known and gifted statist, in a memoir on epidemics, read before the *Academie de Medecine*, congratulated his fellow citizens on the probable, nay almost certain immunity, they were to enjoy from the cholera, as well as from all other similar visitations. "Paris," he said, "exceeded all other cities in the extent of its civilization; the inhabitants of that capital were the strongest in moral courage of any nation in the world,—were unrivalled in physical energy;" it was superintended and controlled by an excellent and indefatigable medical police; no nuisances there existed; knackeries, laystalls, dunghills, and all other similar nuisances, were carefully removed from it beyond the barriers; in short, the provisions of the "code sanitaire," taken along with the circumstances of the citizens, were either to defend them

altogether from the cholera, or so to divest the disease of its sting, that the monster would be harmless in the precincts of the privileged town, and might be visited and stared at as one of the lions of the day. But what has proved to be the fact? From the prime minister, the peer, the deputy, and the general, to the pauper, "*chiffonier*" and "*debardeur*," all classes of inhabitants have been smitten, and in equal ratio to the proportion which they bear in numbers to each other. The timid and the brave, the weakly and the robust, from the infant to the decrepid man, all suffer from the scourge; and more victims fall daily within the walls of Paris than sufficed for the overthrow of the moral pest exterminated in face of the barricades of July.

Public Health.

ANNUAL REPORTS OF MEDICAL OFFICERS OF HEALTH.

County Borough of Hanley.—The population of this borough is estimated by Mr. John Clare at 68,831, the density of the population being 35·5 persons per acre. The extent to which the services of women are being utilised for public health work at the present time is well illustrated by the fact that in Hanley alone a female health visitor and a female inspector of midwives have recently been appointed, as well as a lady doctor as school medical officer at a salary of £250 per annum. There was an epidemic of measles in Hanley during the autumn of 1909. This disease is notifiable in a voluntary sense in the district, but only as regards the first case in each household. Even with the above limitations there were no fewer than 647 cases notified during 1909. The invaded houses were visited by the sanitary inspector and instructions given as to the isolation of the patients. No child was admitted to school from an invaded house until a month after the commencement of the illness—presumably of the last case in any given house. Disinfection was carried out by means of formalin. In addition to all these precautions the infants' schools were closed for about two months. No comments are offered by the medical officer of health as to the value of the voluntary notification of measles, and as we are not told for how many years notification has been in force it is difficult to draw any reliable inferences from the figures furnished in this report. The fatality-rate per 100 notified cases (not, of course, all the cases which occurred) was 8 in 1909, and the same rate has varied from 4·3 to 16·1 since 1892, the rate in 1908, when there were 187 cases, having been 11 per 100 notified cases. There were 267 cases of diphtheria notified in 1909, and among the precautions taken to control the spread of the disease was the use of diphtheria antitoxin as a prophylactic, the general practitioners of the town being paid 2*s.* 6*d.* for the first person injected and 1*s.* for every other person in the same house. It is not clear whether these fees were in addition to the supply of antitoxin gratuitously. Here, at any rate, we have the municipality adopting very much the attitude as regards the prevention of diphtheria which the State adopts as regards the prevention of small-pox, and it is worthy of note that in the case of diphtheria the municipality sometimes pays not only for the prevention but also for the treatment of the disease. An extension of this principle would carry the medical practitioner into the position of becoming almost the servant of the borough council, a position which stimulates a number of instructive reflections. There were 86 cases of enteric fever notified in 1909, and it is, unfortunately, by no means clear what they were due to, as milk, shell-fish, and celery appear to have been excluded. It is not satisfactory to find so large a number of cases of enteric fever unaccounted for. On Oct. 5th, 1909, the notification of ophthalmia neonatorum was introduced, and up to the end of the year 3 cases were notified. There were 67 cases of pulmonary tuberculosis notified under the Public Health (Tuberculosis) Regulations.

Woodford Urban District.—The infantile mortality in this district showed a marked reduction on that of recent years, the rate for 1909 having been only 59·4 per 1000 births, as against an average for the last ten years of 113. The type of scarlet fever which is prevailing in the district is a very mild one, and Mr. W. G. Groves reports that several cases were not discovered until the patients were found to be desquamating. He adds that since scarlet fever became notifiable there have been in Woodford 999 cases notified with only 11 deaths, a fatality rate which suggests to some minds that possibly our isolation hospitals might be put to more profitable uses than the isolation of cases of scarlet fever. But this raises the difficult question as to how far this diminished fatality rate in the case of scarlet fever is due to the influence of isolation hospitals.

Reigate Rural District.—Dr. A. E. Porter refers in his current report to the influence of "holiday children" in introducing disease into this district, and he adds that scarcely a year passes without cases of diphtheria or scarlet fever being introduced from London or other large cities. In August there were 6 cases of diphtheria in the hospital, 5 of whom were either visitors or their victims, and he evidently suspects that these holiday children were responsible for outbreaks of scarlet fever in other parts of the district. It is proposed to distribute circulars to cottagers who take in these holiday children warning them of the danger incurred. It would seem not unreasonable to require a certificate of health with the children. Four cases of pulmonary tuberculosis were notified under the Public Health (Tuberculosis) Regulations.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

In 77 of the largest English towns 8804 births and 4857 deaths were registered during the week ending April 9th. The annual rate of mortality in these towns, which had been equal to 13·5, 13·9, and 14·4 per 1000 in the three preceding weeks, further rose to 14·9 in the week under notice. During the 13 weeks of last quarter the annual death-rate in these towns did not exceed 15·0 per 1000, and was 3·0 below the average rate in these towns in the four preceding corresponding quarters; in London the mean rate during last quarter was only equal to 14·9 per 1000. The lowest reported annual rates of mortality in the 77 towns during last week were 4·2 in Hornsey, 6·2 in Reading, 7·8 in Southampton, and 9·2 in Walthamstow; the rates in the other towns ranged upwards, however, to 19·8 in Huddersfield, 21·2 in Rotherham, 21·3 in Oldham, and 22·9 in Rhondda. In London the recorded death-rate last week did not exceed 14·7 per 1000. The 4857 deaths registered in the 77 towns during the week showed a further increase of 243 upon the numbers returned in the three preceding weeks, and included 362 which were referred to the principal epidemic diseases, against 317 and 332 in the two previous weeks; of these 362 deaths, 151 resulted from whooping-cough, 104 from measles, 35 from diphtheria, 27 from diarrhœa, 26 from scarlet fever, 17 from enteric fever, and 2 from small-pox. The mean annual rate of mortality in the 77 towns during the week from these epidemic diseases was equal to 1·1 per 1000, against 1·0 in each of the three preceding weeks. No death from any of these epidemic diseases was registered last week in Middlesbrough, Walsall, Northampton, St. Helens, or in eight other smaller towns; the annual death-rates therefrom ranged upwards, however, to 2·3 in Hastings and in Rhondda, 2·5 in Oldham, 3·1 in Liverpool, and 3·3 in Merthyr Tydfil. The fatal cases of whooping-cough, which had been 134 and 139 in the two previous weeks, further rose to 151 in the week under notice, and caused annual death-rates equal to 1·5 in Hastings, 1·7 in Birkenhead, 1·8 in Devonport and in King's Norton, and 2·2 in Oldham. The deaths from measles, which had been 78 and 93 in the two previous weeks, further rose to 104 last week; the highest death-rates from this disease during the week were 1·3 in Cardiff, 1·5 in Bootle and in Burnley, and 2·0 in Merthyr Tydfil. The 35 deaths referred to diphtheria corresponded with the number in the previous week, and included 11 in London and its suburban districts, 4 in Manchester and Salford, 4 in Leeds, and 2 both in Sheffield and in Cardiff. The 27 deaths attributed to diarrhœa showed a decline of 3 from the number in the previous week. The fatal cases of scarlet fever, which had declined in the four preceding weeks from 34 to 25, were last week 26, of which 3 occurred in Liverpool and 2 each in Stoke-on-Trent, Newport (Mon.), Rhondda, and Merthyr Tydfil. The 17 deaths referred to enteric fever showed an increase of 7 upon the low

number in the previous week; they included 3 in Liverpool and in Manchester and Salford, and 2 in London and in Nottingham. The 2 fatal cases of small-pox occurred in Blackburn and in Sheffield The number of scarlet fever patients under treatment in the Metropolitan Asylums and in the London Fever Hospital, which had steadily declined in the 25 preceding weeks from 2819 to 1611, had further fallen to 1554 on April 9th; 166 new cases of this disease were admitted to these hospitals during last week, against 180, 173, and 158 in the three preceding weeks. The Metropolitan Asylums Hospitals contained no case of small-pox on April 9th. Of the 1377 deaths registered in London during the week under notice 281 were referred to pneumonia and other diseases of the respiratory system, showing a decline of 29 from the number in the previous week, and were 70 below the corrected average number in the corresponding week of the five years 1905–09. The causes of 45, or 0·9 per cent., of the deaths registered in the 77 towns were not certified either by a registered medical practitioner or by a coroner. All the causes of death registered during the week were duly certified in London, Bristol, Bradford, West Ham, Newcastle-on-Tyne, Hull, and in 46 other smaller towns; the 45 uncertified causes of death in the 77 towns included 8 in Birmingham, 4 in Liverpool, and 3 both in Stoke-on-Trent and in Manchester.

HEALTH OF SCOTCH TOWNS.

In eight of the principal Scotch towns 978 births and 659 deaths were registered during the week ending April 9th. The annual rate of mortality in these towns, which had been equal to 15·3 and 18·1 per 1000 in the two preceding weeks, further rose slightly to 18·2 in the week under notice. During the 13 weeks of last quarter the annual death-rate in these towns averaged 17·5 per 1000, and exceeded by 2·5 the mean rate during the same period in the largest English towns. The annual death-rates during last week in these eight Scotch towns ranged from 11·8 and 14·5 in Aberdeen and Edinburgh to 29·1 in Greenock and 29·4 in Dundee. The 659 deaths from all causes in the eight towns during the week showed an increase of but 3 upon the number in the previous week, but included 123 which were referred to the principal epidemic diseases, against 72, 77, and 82 in the three preceding weeks. These 123 deaths were equal to an annual rate of 3·4 per 1000; the mean death-rate from the same diseases in the 77 English towns last week did not exceed 1·1 per 1000. These 123 deaths in the Scotch towns included 74 from measles, 17 from diarrhœa, 14 from diphtheria, 10 from scarlet fever, 6 from whooping-cough, and 2 from "fever," but not one from small-pox. The fatal cases of measles, which had been 45 and 43 in the two preceding weeks, rose to 74 last week and exceeded the number in any previous week of this year; they included 28 in Dundee, 15 in Glasgow, 14 in Greenock, 11 in Edinburgh, and 6 in Leith. The 17 deaths attributed to diarrhœa showed a decline from the high number in the previous week, but included 11 in Glasgow and 5 in Dundee. The 14 deaths referred to diphtheria considerably exceeded the numbers in recent weeks; 6 occurred in Glasgow, 3 in Greenock, and 2 both in Edinburgh and in Paisley. The fatal cases of scarlet fever also showed a marked increase, and included 6 in Glasgow and 2 in Dundee. Two deaths from whooping-cough were returned in Glasgow, in Edinburgh and in Dundee. Of the 2 deaths referred to "fever" 1 case of typhus was registered in Glasgow and 1 of enteric in Paisley. The deaths in the eight towns referred to diseases of the respiratory system, which had been 100 and 122 in the two previous weeks, declined again to 114 in the week under notice, but exceeded by 6 the number in the corresponding week of last year. The causes of 17, or 2·6 per cent., of the deaths in the eight towns were not certified or not stated; in the 77 English towns the proportion of uncertified causes of death did not exceed 0·9 per cent.

HEALTH OF IRISH TOWNS.

In Dublin 255 births and 181 deaths were registered during the week ending April 9th. The 181 deaths exceeded the numbers in recent weeks, and were equal to an annual rate of 23·4 per 1000; the rate during the same week did not exceed 14·7 in London and 14·5 in Edinburgh. During the 13 weeks of last quarter the annual death-rate in Dublin averaged 23·8 per 1000, against 14·9 in London. The 181 deaths registered in Dublin during the week under notice included but 6 which were referred to the principal epidemic diseases, against 6 and 2 in the two preceding weeks; of these 6 deaths, 4 resulted from diarrhœa and 1 each from diphtheria and enteric fever, whereas no death was referred to measles, scarlet fever, whooping-cough, or small-pox. The death-rate during the week from these principal epidemic diseases did not exceed 0·8 per 1000 in Dublin last week, the rate from the same diseases last week being 1·1 in London and 2·5 in Edinburgh. Of the 181 deaths registered in Dublin last week, 71, or 39·2 per cent., were recorded in public institutions. The causes of 9, or 4·9 per cent., of the deaths in the city last week were not certified. In Belfast 254 births and 168 deaths were registered during the week under notice. The annual rate of mortality in Belfast, which had been equal to 16·7 and 18·4 per 1000 in the two preceding weeks, further rose to 22·4 in the week ending April 9th, and was only slightly below the high rate in Dublin. During the 13 weeks of last quarter the annual death-rate in Belfast averaged 20·3 per 1000, against 23·8 in Dublin. The 168 deaths in Belfast during the week under notice included 24 which were referred to the principal epidemic diseases, against 14 and 17 in the two preceding weeks; of these 24 deaths 12 resulted from whooping-cough, 11 from measles, and 1 from diphtheria, but not one from scarlet fever, enteric fever, diarrhœa, or small-pox. These 24 deaths were equal to an annual rate of 3·2 per 1000, whereas the rate from the same diseases did not exceed 0·8 in Dublin. The fatal cases both of whooping-cough and of measles showed a considerable increase in Belfast last week. The causes of all but one of the 168 deaths in Belfast last week were duly certified.

VITAL STATISTICS OF LONDON DURING MARCH, 1910.

In the accompanying table will be found summarised complete statistics relating to sickness and mortality in the City of London and in each of the metropolitan boroughs. With regard to the notified cases of infectious diseases, it appears that the number of persons reported to be suffering from one or other of the nine diseases specified in the table was equal to an annual rate of 4·1 per 1000 of the population, estimated at 4,872,702 persons in the middle of the year. In the three preceding months the rates had been 5·4, 4·5, and 4·6 per 1000 respectively. The lowest rates last month were recorded in Kensington, Chelsea, Hammersmith, Stoke Newington, Holborn, and the City of London; and the highest rates in Fulham, Poplar, Bermondsey, Battersea, Deptford, Lewisham, and Woolwich. The prevalence of scarlet fever showed a slight decrease last month; among the several boroughs this disease was proportionally most prevalent in St. Pancras, Lambeth, Battersea, Wandsworth, Lewisham, and Woolwich. The Metropolitan Asylums Hospitals contained 1584 scarlet fever patients at the end of last month, against 2392, 1962, and 1740 at the end of the three preceding months; the weekly admissions averaged 180, against 250, 198, and 204 in the three preceding months. Diphtheria was considerably less prevalent than it had been in any of the six preceding months; the greatest proportional prevalence of this disease was recorded in Fulham, Stepney, Poplar, Bermondsey, Battersea, Deptford, Greenwich, Lewisham, and Woolwich. The number of diphtheria patients under treatment in the Metropolitan Asylums Hospitals, which had been 904, 883, and 908 at the end of the three preceding months, had declined to 852 at the end of last month; the weekly admissions averaged 82, against 97, 96, and 93 in the three preceding months. The prevalence of enteric fever showed but little variation from that recorded in the previous month; this disease was proportionally most prevalent in Kensington, Chelsea, the City of Westminster, Finsbury, Poplar, Battersea, Camberwell, and Greenwich. There were 84 enteric fever patients under treatment in the Metropolitan Asylums Hospitals at the end of last month, against 62 and 75 at the end of the two preceding months; the weekly admissions averaged 12, against 10 and 12 in the two preceding months. Erysipelas was proportionally most

ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING MARCH, 1910.

(Specially compiled for THE LANCET.)

CITIES AND BOROUGHS.	Estimated population in the middle of 1910.	NOTIFIED CASES OF INFECTIOUS DISEASE.											DEATHS FROM PRINCIPAL INFECTIOUS DISEASES.										Deaths from all causes.	Death-rate per 1000 living.†
		Small-pox.	Scarlet fever.	Diphtheria.*	Typhus fever.	Enteric fever.	Other continued fevers.	Puerperal fever.	Erysipelas.	Cerebro-spinal meningitis.	Total.	Annual rate per 1000 persons living.	Small-pox.	Measles.	Scarlet fever.	Diphtheria.*	Whooping-cough.	Typhus fever.	Enteric fever.	Other continued fevers.	Diarrhœa.	Total.	Annual rate per 1000 persons living.		
LONDON...	4,872,702	1	984	472	—	104	1	21	298	17	1898	4·1	—	122	33	38	227	—	18	1	48	487	1·0	6171	13·9
West Districts.																									
Paddington	153,004	—	27	11	—	1	—	1	8	1	49	3·3	—	10	1	—	7	—	2	—	1	21	1·4	173	12·6
Kensington	184,635	—	19	8	—	6	—	1	11	—	45	2·5	—	4	—	—	1	—	3	—	2	10	0·6	230	14·0
Hammersmith	127,413	—	33	13	—	—	—	2	10	—	58	4·7	—	14	1	—	1	—	—	—	—	16	1·3	148	12·6
Fulham	181,282	—	34	28	—	2	—	2	16	1	83	4·8	—	6	—	1	6	—	—	—	—	13	0·7	169	10·1
Chelsea	75,457	—	10	4	—	5	—	—	1	—	20	2·8	—	—	—	—	—	—	1	—	—	1	0·1	90	12·8
City of Westminster	167,233	—	33	19	—	5	—	—	7	—	64	4·0	—	2	—	1	2	—	—	—	1	6	0·4	208	14·6
North Districts.																									
St. Marylebone	125,195	—	28	11	—	2	—	—	7	—	48	4·0	—	2	2	—	10	—	1	—	3	18	1·5	173	15·3
Hampstead	95,729	—	16	—	—	1	—	—	1	1	19	2·1	—	2	—	—	—	—	—	—	—	2	0·2	80	9·8
St. Pancras	237,792	—	69	13	—	4	—	1	16	2	105	4·6	—	2	—	—	14	—	—	—	1	17	0·7	276	12·7
Islington	353,356	—	54	38	—	4	—	1	8	3	108	3·2	—	—	2	4	25	—	1	—	3	35	1·0	430	13·2
Stoke Newington	54,838	—	11	2	—	—	—	—	1	1	15	2·9	—	—	—	—	1	—	—	—	—	1	0·2	64	12·7
Hackney	239,979	—	33	17	—	3	—	2	13	—	68	3·0	—	7	2	—	15	—	—	—	1	25	1·1	311	14·1
Central Districts.																									
Holborn	53,142	—	4	5	—	—	—	—	3	—	12	2·4	—	—	—	1	1	—	1	—	2	5	1·0	76	16·0
Finsbury	94,578	—	8	9	—	6	—	1	9	—	33	3·6	—	—	1	5	3	—	—	—	3	12	1·3	141	16·1
City of London	17,132	—	1	1	—	—	—	—	1	1	4	2·4	—	—	—	—	—	—	—	—	—	—	—	22	14·7
East Districts.																									
Shoreditch	114,387	—	14	11	—	2	—	—	13	—	40	3·6	—	12	1	—	9	—	—	—	1	23	2·1	179	17·1
Bethnal Green	131,579	—	15	14	—	1	1	—	13	1	45	3·6	—	8	1	2	5	—	1	—	2	19	1·5	215	17·2
Stepney	314,379	—	36	39	—	7	—	1	22	2	107	3·5	—	6	—	6	21	—	2	—	4	39	1·3	439	15·3
Poplar	172,432	—	39	21	—	6	—	2	11	1	80	4·8	—	4	—	2	17	—	2	—	5	30	1·8	253	15·8
South Districts.																									
Southwark	211,832	—	24	19	—	2	—	1	19	—	65	3·2	—	8	2	2	13	—	—	—	3	28	1·4	350	18·0
Bermondsey	127,238	1	31	21	—	2	—	—	5	—	60	4·9	—	2	2	2	4	—	—	—	2	12	1·0	209	17·5
Lambeth	327,074	—	86	23	—	9	—	—	19	—	137	4·4	—	—	1	2	6	—	3	—	—	12	0·4	409	13·4
Battersea	188,222	—	68	23	—	7	—	1	22	1	122	6·8	—	8	1	1	9	—	—	1	5	25	1·4	225	13·4
Wandsworth	305,838	—	82	26	—	4	—	2	21	1	136	4·6	—	2	6	1	11	—	—	—	—	20	0·7	318	11·4
Camberwell	286,058	—	54	25	—	12	—	1	15	1	108	3·9	—	4	2	3	17	—	1	—	4	31	1·1	344	13·0
Deptford	119,642	—	29	14	—	3	—	—	11	—	57	5·0	—	10	2	1	10	—	—	—	—	23	2·0	171	15·7
Greenwich	112,935	—	16	14	—	5	—	—	4	—	39	3·6	—	6	—	1	14	—	—	—	1	22	2·0	141	13·3
Lewisham	164,899	—	59	25	—	2	—	2	5	—	93	5·9	—	3	1	2	2	—	—	—	2	10	0·6	184	12·1
Woolwich...	135,422	—	51	17	—	3	—	—	5	—	76	5·9	—	—	5	1	3	—	—	—	2	11	0·8	143	11·8
Port of London	—	—	—	1	—	—	—	—	1	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* Including membranous croup.

† The death-rates are corrected for variations in sex- and age-constitution of the populations of the several boroughs, the population of England and Wales being taken as the standard.

prevalent in Hammersmith, Fulham, Finsbury, Shoreditch, Bethnal Green, Southwark, Battersea, and Deptford. The 21 cases of puerperal fever notified during the month included 2 in Hammersmith, 2 in Fulham, 2 in Hackney, 2 in Poplar, 2 in Wandsworth, and 2 in Lewisham. Of the 17 cases of cerebro-spinal meningitis 3 belonged to Islington and 2 each to St. Pancras and Stepney.

The mortality statistics in the table relate to the deaths of persons actually belonging to the various boroughs, the deaths occurring in institutions having been distributed among the several boroughs in which the deceased persons had previously resided; the death-rates are further corrected for variations in the sex and age constitution of the population of the several boroughs. During the five weeks ending April 2nd, the deaths of 6171 London residents were registered, equal to a corrected annual death-rate of 13·9 per 1000; in the three preceding months the rates were 15·8, 14·8, and 16·6 per 1000. The lowest death-rates last month were 9·8 in Hampstead, 10·1 in Fulham, 11·4 in Wandsworth, 11·8 in Woolwich, and 12·1 in Lewisham; the highest rates were 15·3 in St. Marylebone, 16·0 in Holborn, 16·1 in Finsbury, 17·1 in Shoreditch, 17·2 in Bethnal Green, 17·5 in Bermondsey, and 18·0 in Southwark. The 6171 deaths from all causes included 487 which were referred to the principal epidemic diseases; of these 122 resulted from measles, 33 from scarlet fever, 38 from diphtheria, 227 from whooping-cough, 18 from enteric fever, 1 from ill-defined pyrexia, and 48 from diarrhœa, but not any from small-pox or from typhus fever. No death from any of these epidemic diseases was recorded last month in the City of London; among the metropolitan boroughs they caused the lowest death-rates in Chelsea, the City of Westminster, Hampstead, Stoke Newington, and Lambeth; and the highest rates in St. Marylebone, Shoreditch, Bethnal Green, Poplar, Deptford, and Greenwich. The 122 deaths from measles were less than half the corrected average number in the corresponding period of the five preceding years; the greatest proportional mortality from this disease was recorded last month in Paddington, Hammersmith, Shoreditch, Bethnal Green, and Deptford. The 33 fatal cases of scarlet fever were 15 fewer than the corrected average number; this disease was proportionally most fatal in St. Marylebone, Bermondsey, Wandsworth, Deptford, and Woolwich. The 38 deaths from diphtheria showed a decline of 40 from the corrected average number; the greatest proportional mortality from this disease occurred in Finsbury, Stepney, Bermondsey, and Bethnal Green. The 227 fatal cases of whooping-cough were 26 in excess of the corrected average number; the highest death-rates last month from this disease were recorded in St. Marylebone, Islington, Shoreditch, Stepney, Poplar, Deptford, and Greenwich. The 18 deaths referred to enteric fever were equal to the corrected average number; of these 18 deaths 3 belonged to Kensington, 3 to Lambeth, and 2 each to Paddington, Stepney, and Poplar. The 48 fatal cases of diarrhœa were 19 below the corrected average number; the greatest proportional mortality from this disease was recorded last month in St. Marylebone, Holborn, Finsbury, Poplar, and Battersea. In conclusion, it may be stated that the aggregate mortality in London last month from these principal infectious diseases was nearly 30 per cent. below the average.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

IN accordance with the provisions of Her late Majesty's Order in Council of April 1st, 1881, Surgeon Henry William Worth Townsend has been allowed to withdraw from His Majesty's Naval Service, with a gratuity (dated April 6th, 1910).

ROYAL ARMY MEDICAL CORPS.

Colonel Sir David Bruce, C.B., F.R.S., has arrived home from Uganda on completion of a tour of special duty connected with the Sleeping Sickness Commission. Lieutenant-Colonel M. O'D. Braddell has been selected for increased pay under Article 317 of the Royal Warrant from March 6th, vice Lieutenant-Colonel W. G. Macpherson, C.M.G., promoted Colonel. Lieutenant-Colonel J. V. Salvage has been appointed to command the station hospital at Muttra. Lieutenant-Colonel C. H. Burtchaell, Staff Officer to the Principal Medical Officer, Irish Command, has been directed to join the London District for temporary duty. Lieutenant-Colonel H. Cocks, from Wellington, Lieutenant-Colonel F. G. W. Gordon-Hall, from Muttra, and Lieutenant-Colonel H. P. G. Elkington, from Jhansi, have arrived home on expiration of their tour of service in India. Lieutenant-Colonel C. L. Josling, recruiting medical officer, London Recruiting Area, has been transferred to the Western Command. Lieutenant-Colonel R. W. Wright has been transferred from the Royal Arsenal to the Eastern Command. Lieutenant-Colonel G. Wilson, from Multan, has been posted to the Eastern Command and appointed in charge of the Military Hospital at Dover. Lieutenant-Colonel W. T. Swan, from Chakrata, has been appointed to the Royal Victoria Hospital at Netley and placed in charge of the Medical Division. Major H. G. Martin has been transferred from the Seventh (Meerut) Division to the Eighth (Lucknow) Division and appointed to command the station hospital at Lebong. Major J. Thomson has been posted to Pretoria and Major O. L. Robinson to Meerut. Major H. E. Winter has been transferred from Chatham to Gravesend and Major A. Pearse from Woolwich has been posted to Chatham. Major W. P. Gwynn, from Quetta, has been posted to Karachi. Major K. M. Cameron has been appointed specialist in advanced operative surgery to the Aldershot Command. Major S. A. Archer has been appointed specialist in ophthalmology to the Third (Lahore) Division, with effect from Feb. 1st. Major W. E. Hudleston, from Mhow, has been posted to Gosport, and Major H. O. B. Browne-Mason, from London, has been posted to Poona. Captain T. S. Blackwell has been granted an extension of his leave from India. Captain E. T. Inkson, V.C., has been appointed specialist in dermatology to the Ninth (Secunderabad) Division, with effect from March 1st. Captain S. O. Hall, Captain A. J. Hull, Captain D. P. Watson, and Captain R. T. Collins have arrived home on completion of a tour of service in India. Captain J. W. Leake and Captain A. L. A. Webb have embarked for West Africa. Captain F. M. M. Ommanney and Captain A. C. Osburn have been posted for duty to the Eastern Command. Captain J. H. R. Bond, from York, has been appointed to Mhow. Captain R. N. Woodley, from Cork, has been transferred to Cahir, and Captain J. A. W. Webster, from Gravesend, has been transferred to Shoeburyness. Captain T. E. Fielding has been appointed Adjutant of the Royal Army Medical Corps School of Instruction, Territorial Force, London District. Lieutenant M. J. Williamson, from Tidworth, has been posted for duty to Bulford Camp, Salisbury Plain. Lieutenant D. F. Mackenzie, from Lebong, has been posted to Calcutta. Lieutenant G. F. Dawson has been attached for special duty connected with antityphoid inoculation to the King's Royal Rifles stationed at Meerut. Lieutenant J. E. Ellcome and Lieutenant R. M. Dickson have embarked for India.

Captain Albert J. W. Wells retires, receiving a gratuity (dated April 13th, 1910).

Lieutenant Francis L. Bradish to be Captain (dated Jan. 30th, 1910).

INDIAN MEDICAL SERVICE.

The Chancellor of the Allahabad University has nominated Lieutenant-Colonel C. C. Manifold, Officiating Inspector-General of Civil Hospitals in the United Provinces, to be a Fellow of the Allahabad University. Lieutenant-Colonel H. B. Melville, Civil Surgeon of Simla (West), has been appointed to officiate as Health Officer and District Plague Medical Officer during the absence on leave of Captain K. W. Mackenzie. Lieutenant-Colonel F. J. Crawford, Civil Surgeon, Hooghly, has been granted two years' leave. The Viceroy has selected Major F. O'Kinealy for the appointment of Civil Surgeon at Simla in succession to Captain J. Leicester, who has been appointed to officiate as Professor of Midwifery at the Medical College, Calcutta, during the absence on leave of Lieutenant-Colonel C. R. M. Green. Major F. D. S. Fayrer, Bombay, has had his leave from India extended by four months, on medical certificate. Major W. H. Ogilvie has had his leave extended. Captain J. K. S. Fleming has been appointed to officiate as Civil Surgeon at Banda, vice Captain W. MacM. Pearson, granted leave. The services of Captain G. P. T. Groube, Assistant Plague Medical Officer, Ferozepore, have been placed at the disposal

of the Home Department of the Government of India. Captain T. S. Ross from Madras General Hospital has proceeded to Amritsar for special duty in connexion with malaria field-work under the direction of Captain S. R. Christophers, assistant to the Director of the Central Research Institute, Kasauli. Captain J. Husband, medical officer of the 59th Scinde Rifles (Frontier Force), has been appointed to the charge of the Brigade Laboratory at Kohat. Captain C. A. Godson has been appointed to the charge of the jail at Barisal, Eastern Bengal, vice Captain L. B. Scott. Captain W. H. Tucker has been granted leave for one year and seven months, with effect from April 9th, and Captain J. H. Burgess has been granted one year's furlough combined with study-leave. Captain W. D. Richie, Captain W. H. Dickinson, Captain H. Dalk, and Captain H. B. Drake have arrived home on leave. Lieutenant F. O'D. Fawcett, attached to the 23rd Cavalry (Frontier Force) at Kohat, has been transferred for duty with the 59th Scinde Rifles (Frontier Force) at Peshawar. Lieutenant A. J. H. Russell has been appointed a specialist in the prevention of disease at Secunderabad.

SPECIAL RESERVE OF OFFICERS.

Royal Army Medical Corps.

Charles Max Page to be Lieutenant (on probation) (dated March 14th, 1910).

THE TERRITORIAL MEDICAL SERVICE.

At a meeting of the General Purposes Committee held recently at Warwick, it was stated that the British Medical Association brought to notice that it considered that officers commanding general hospitals should have seats on the county associations and that it thought it desirable that means should be found whereby each medical unit should have its own drill hall. Sir Henry Fairfax Lucy stated that some time ago the War Office allowed them to increase their number but would go no further, and he did not see what could be done in the matter. The principal medical officer of the division had approved of the suggestion of the British Medical Association, but in view of the chairman's statement it was felt that no steps could be taken.

The London Royal Army Medical Corps School of Instruction for Territorial R.A.M.C. officers announces that a course of drill for all London medical units will be held at Somerset House during April, May, and June, on Tuesday and Friday evenings, commencing on April 19th. A revision class for officers for the May examinations in subject B will be held at Calthorpe-street, W.C., on Tuesdays, May 3rd and 10th; Thursdays, May 5th and 12th; and Fridays, May 6th and 13th.

THE BRITISH RED CROSS SOCIETY.

Sir Frederick Treves will address a meeting convened by the Hon. Mrs. Charles White, Vice-President of the Aldershot and Farnborough Division of the Red Cross Society, at the Masonic Temple, Station-road, Aldershot, to-day (Friday), April 15th, at 2.45 P.M.

The annual meeting of the Gloucestershire branch of the Red Cross Society was held at the Shire Hall, Gloucester, on April 9th, under the presidency of the Duchess of Beaufort. The report showed an available balance of £75. Captain Colchester Wemyss, the honorary county director, said 15 men's detachments and something like 35 or 36 women's detachments had been either definitely raised or were in process of formation. By June 1st, when they had to send in their first half-yearly returns to the War Office, he had no doubt they would be able to send in a list of no less than 50 detachments (including men and women) definitely formed and in proper working order.

EXPERIENCES WITH BIER'S METHOD IN THE GERMAN NAVY.

During the years 1906–07 it is reported (Sanitätsbericht über die K. Deutschen Marine) that Bier's method was used in the German Navy for the treatment of whitlows and boils. Whitlows, it is said, were (as in other countries) sometimes cured easily, but in certain cases required extensive and repeated incisions and scrapings with prolonged attention. Of the 252 cases, however, that occurred, some 60 were treated by Bier's plan of venous congestion with great advantage, and the sooner this was commenced the better was the result. It was particularly noted that severe advancing inflammations began at once to decrease as soon as the elastic bandage was applied. Ordinary methods of treatment were employed at the same time, but much smaller incisions were required. Connective-tissue inflammations and abscesses occurred so frequently in men going barefoot that the men of one training ship had to be made to wear boots always. It would be interesting to learn whether the decks of this ship were washed with perchloride of mercury as is done in some English mail steamers, for such a precaution materially prevents accidental wounds from becoming inflamed. Bier's method was also used in the treatment of these abscesses, and is commended by all who write with experience of its use, and by some enthusiastically. The only case of abscess invalided was treated exclusively on the old lines. Boils occurred mostly in summer and in the tropics, and particularly on the knees and elbows of men working in boilers. Bier's suction glasses were used constantly. They greatly diminished pain and subsequent disfigurement. But the editor of this section (Marine Stabsarzt Dr. Tillmann) strongly recommends the puncture of boils and threatening boils with a fine electric cautery as less painful, more convenient, and necessitating a shorter after-treatment than any other method of treatment.

THE NAVAL MEDICAL SUPPLEMENTAL FUND.

At the quarterly meeting of the directors of the Naval Medical Supplemental Fund, held on April 12th, Inspector-General W. H. Lloyd, R.N., in the chair, the sum of £60 was distributed among the several applicants.

Surgeon-General John C. Dorman, C.M.G., has been appointed an Honorary Physician to the King, vice Surgeon-General Sir A. Keogh, K.C.B.

Correspondence.

"Audi alteram partem."

THE CLIMATE OF HONG-KONG, WITH ACCOUNT OF JOURNEY FROM THERE TO LONDON.

To the Editor of THE LANCET.

SIR,—Reverting to your article in THE LANCET of Jan. 15th on "December, 1909, at Home and Abroad," p. 188, I would refer to the climatic conditions prevailing in Hong-Kong during the past winter months. In no other part of the world that I know of was there so much sunshine. In the three months, November to January inclusive, there were 577·9 hours of sunshine; in December alone there were 249·7 hours, 61 per cent. of the greatest possible duration of sunshine. The rainfall was practically *nil*, amounting to less than an inch for the three months, and the air is cool and bracing, the prevailing wind being E.N.E. I am convinced that were the facts known this place would be used more as a winter resort for Britishers who can afford to travel and wish to escape the inclement wintry weather in England. Once the Kouloon-Canton railway is completed—and we hope to have trains running on the British section this year—and the Canton to Hankow railway is finished, one will be able to travel from Calais to Kouloon in a few days over a fortnight.

Only last May travelling from Hong-Kong to England *viâ* Siberia I did the journey in less than 20½ days. I left Hong-Kong on May 4th at 1.15 P.M. and travelled by the Pacific Mail Steamship Company's steamer *Siberia* (18,000 tons) to Shanghai. We arrived at Woosung early on May 7th and were in Shanghai at 10 A.M. that day. We had 36 hours there and left Shanghai at 10 P.M. on May 8th, travelling by the *Kobe Maru* to Dalny, where we arrived at 7 P.M. on May 10th. I spent the night at the Yumato Hotel and left Dalny at 11.15 A.M. on May 11th. Thence we journeyed to Changchun by the Southern Manchurian Railway *viâ* Lao Yang (one of the battlefields of the late Russo-Japanese war) and Mukden, arriving at Changchun at daylight on May 12th. We there changed to a Russian train, as we were here on the Russo-Japanese frontier, left at 6 A.M., and arrived at Harbin at 4 P.M. This part of the journey was very uncomfortable, as the train was a badly appointed one; many of us had to be content with second-class accommodation and very inferior at that.

We had quite a rush to transfer ourselves and luggage into the "International Train de Luxe" from Vladivostock to

Moscow, which was awaiting us; several of the passengers lost articles of luggage, especially one lady, who practically lost all of hers, and we left Harbin at 4.30 P.M. on May 12th for Moscow. On the 13th we awoke quite early to find snow lying on the ground; during the night we had ascended some 4000 feet. At 10.45 A.M. we had a few minutes' wait at Khaidar; the temperature was down to 52° F. (at Shanghai it was between 80° and 90° F. on the afternoon of May 8th). We reached the frontier town between Chinese and Russian Siberia at 3 P.M. that afternoon; here we had our baggage examined by the Customs officers. We next traversed the Trans-Baikal district. May 14th: At 7 A.M. we were 3700 feet up; water frozen over here; passed through pine forests. May 15th: 3400 feet altitude at 9.30 A.M. 12 noon arrived at Khilok; very cold, snow falling. Afternoon we descended, and at 6 P.M. were at an altitude of 2100 feet, passing now through an uncultivated plateau with pine trees growing thereon. At Lake Baikal, which was partly frozen over, it was a lovely sight, the railway skirting the borders of the lake, the mountains behind being covered with snow; this with the sun shining on them, reminded one forcibly of the Swiss mountain scenery. We arrived at Irkutsk at 9.15 A.M., some 1400 feet above the sea level. We changed trains here and travelled direct to Moscow. May 16th: Quite cold again this morning; snow still lying on the ground; still traversing pine forests. Arrived at Kranoiavek 7 P.M. (500 feet altitude). After this the railway ascended to some 1500 feet altitude. May 17th: At 10.30 A.M. at Taija, the junction for Tomsk; raining during the night; weather much milder. May 18th: Omsk at 9 A.M. May 19th: Crossed the Ural Mountains last night. This day we were delayed for some few hours by having to stop and replace an overheated axle. May 20th: At breakfast we found we were some nine hours late, passing through lovely country with lilies of the valley growing wild, large bouquets of which could be bought for a trifle at the stations. May 21st: Arrived at Moscow 4 P.M., too late to catch the connexion to Warsaw. We just had time to see the Kremlin, &c., and took the night train to St. Petersburg, where we arrived at 9.30 A.M. on May 22nd. Spent 12 hours there; it was very cold, temperature below 40° F. Left St. Petersburg at 10 P.M. that night and travelled in "the Nord express" through Germany and Belgium *viâ* Ostend to Dover, reaching Charing Cross at 10 P.M. on the 24th.

I have detailed this journey somewhat, as I thought it might prove of interest to some intending travellers. Altogether the journey took me 20½ days from Hong-Kong to Charing Cross, and out of that time I had a day and a half at Shanghai, a night at Dalny, and practically a day at St. Petersburg; so that with a through railway connexion between Hong-Kong (Kouloon) and Calais the journey will soon be done in from 16 to 18 days or even less.

I attach the meteorological observations for the three months as supplied by the director of the observatory.

I am, Sir, yours faithfully,

J. M. ATKINSON,
Principal Civil Medical Officer.

Hong-Kong, Feb. 27th, 1910.

*** The official meteorological observations enclosed fully bear out Dr. Atkinson's opening remarks.—ED. L.

THE OCCURRENCE OF ADVENTITIOUS SOUNDS IN THE NORMAL CHEST.

To the Editor of THE LANCET.

SIR,—I have read with great interest the article of Dr. C. Willett Cunnington upon a Note on the Crepitations Heard in the Third Left Intercostal Space in Some Cases of Mitral Stenosis, which occurs in your issue of March 19th. The occurrence of adventitious sounds in individuals in whom there is no other evidence of respiratory trouble is a not uncommon phenomenon, and it was the subject of a short communication which I made at the Winnipeg meeting of the Canadian Medical Association last August. In many apparently healthy people medium or fine crepitations may be heard along the borders of the lungs, especially the left lung, which soon clear up upon the individual taking a few long breaths. The conclusion was come to last year that these crepitations were due to a state of partial collapse of the edges of the lungs that may exist in people who have not taken full breaths for some time. Experiments upon several cadavera seemed to support such a view, as we found that on listening along the edges of recently removed lungs, while they were being inflated, exactly the same sounds occurred as we heard during life. The fact of their rapid disappearance upon deep breathing would also support the view that they are due to collapse and not to congestion or fluid there.

I have not noted that such sounds are specially present in cases of mitral stenosis, but certainly they are not limited to such cases. Dr. Cunnington says that the sounds that he describes are limited to an area which could be covered by a halfpenny in the third left intercostal space, but in many cases they are heard over a much more extended area than this, according to our experience. Thus in a case of acute rheumatism examined this morning, in which there is a slight mitral regurgitation with no evidence of stenosis, I was able to demonstrate to my class crepitations along several inches of the anterior border of the left lung, which rapidly cleared up upon the patient taking a few long breaths. All the same, any condition that would tend to produce collapse of a portion of the lung would be apt to bring about such crepitations, and hence it would seem likely that Dr. Cunnington's explanation of the sound as being due to dilatation of the left auricle would be the correct one.

The chief importance of recognising that such crepitations may occur in normal lungs is that one is less apt to be led into a diagnosis of tuberculosis, as has occurred in one's own experience. We found these crepitations present in about one-third of all the patients in the Children's Hospital here last summer, in the majority of whom there were no other signs of anything abnormal in the lungs. When such sounds are detected in the chest it would seem rational to recommend breathing exercises.

I am, Sir, yours faithfully,

R. D. RUDOLF.

Toronto, March 30th, 1910.

SIMULTANEOUS FRACTURE OF THE PATELLÆ.

To the Editor of THE LANCET.

SIR,—When Mr. William Sheen published his interesting case of Simultaneous Fracture of the Patellæ in THE LANCET of Nov. 13th, 1909, I was struck with the rareness of the lesion. Having had occasion lately to search very thoroughly through the literature of fractures of the patella, I have kept a look-out for records of the simultaneous fracture of both bones. Besides the references which Mr. Sheen gave in his paper I have come across the following paragraph in the *Medical Times and Gazette*, 1874, Vol. II., p. 670:—

Fracture of both patellæ from muscular action.—Dr. Marcy relates the case of a strong woman, aged 38, weighing 170 or 180 pounds, who, while crossing from the curb-stone to the street, by a misstep turned the foot obliquely, and, to save herself from falling, made violent muscular exertion, and fell down. Both patellæ were found to be transversely fractured near the middle, with a separation of two inches. Ligamentous union followed, the fragments being separated from a quarter to half an inch.—*Boston Journal*, October 8.

I venture to send the reference, feeling sure that it will be of interest to Mr. Sheen and to numerous readers of THE LANCET who will have noticed his paper.

I am, Sir, yours faithfully,

A. E. JOHNSON.

Middlesex Hospital, W., April 11th, 1910.

THE SUPPLY OF ANTITETANUS SERUM IN LONDON.

To the Editor of THE LANCET.

SIR,—We have observed paragraphs in the lay papers, and also in the trade press, to the effect that a patient in one of the hospitals suffering from tetanus was unable to receive serum treatment for two days in consequence of there being no antitetanus serum to be had in London.

Please permit us to say that we had on hand at the time stated, and always have on hand, ample supplies of antitetanus serum, and medical men may be assured that all possible requirements for such can be met at a moment's notice.

We are, Sir, yours faithfully,

PARKE, DAVIS, AND CO.

Beak-street, W., April 6th, 1910.

DIFFICULT POINTS IN LIFE INSURANCE.

To the Editor of THE LANCET.

SIR,—As the candidate for insurance concerned in the case which you quote in an annotation with the above heading which appeared in THE LANCET of April 2nd, I have to say that I am certain that a mistake was made in the examination of my urine. If I really believed that a temporary trace of albumin was present I should say nothing, but to believe this one has to suppose that a specimen for some extraordinary reason had only on that particular day showed this abnormality. The urine was carefully tested previous to that day and several times subsequently, on one occasion by an expert, who found it quite healthy and "*absolutely* free from any abnormal constituent." Also, it takes something to make one believe that a deeply amber coloured urine has a specific gravity of 1012. That the same medical examiner at the same examination made a mistake about my height, making me nearly two inches shorter than I am, only shows that his facts were not to be depended on.

I am, Sir, yours faithfully,

April 9th, 1910. THE ONE CONCERNED.

SOLDIERS' TEETH AND OFFICERS.

To the Editor of THE LANCET.

SIR,—I observe that the editor of the *Army and Navy Gazette*, in the issue of that paper of April 9th, pokes fun at you for suggesting that company commanders should be held responsible for the cleanliness of teeth. Well, Sir, he should know that for the exercise of this very proper supervision it is not necessary to have any "morning parade"; the soldiers' teeth could be inspected at a fatigue "fall-in" in their barrack rooms. If the officer can, and does, supervise the cleanliness of feet, it would be most useful work for him to see that the men's teeth are properly brushed. The medical officer is sufficiently well employed with the treatment of the sick and sanitary duties, and might well be helped in a routine that requires no expert medical knowledge and would be of the greatest use to his men.

The disinclination shown by officers to concern themselves with every detail of their company men's welfare should not be encouraged. I have seen on inspection in regimental kitchens boxes containing bread, butter, and cheese in contact with soiled shirts, filthy socks, and brushes and combs. I need scarcely say I did not fail to make generals aware of this state of affairs. Army medical officers cannot live in barrack-rooms every day and all day, but company and regimental officers may well expect to see that their men are cleanly, get good and wholesome food, and that that food is not subjected to contamination.

I am, Sir, yours faithfully,

April 11th, 1910. A. M. O.

A MEDICAL SURVEY IN THE PHILIPPINES.

(FROM A CORRESPONDENT.)

A MORE than ordinarily interesting and important piece of medical work recently has been accomplished in the Far East under the auspices of the Philippine Government. A comprehensive survey on similar lines would do much to unravel knotty problems which still remain unsolved in many of our tropical dependencies and would be well worth the consideration of our colonial authorities. The survey in question was undertaken by the Bureau of Science coöperating with the Bureau of Health, and an expedition was planned to make a complete study of a native town in the Philippine islands under normal conditions. Without mentioning the names of the different specialists (all of them American medical men) who took part in it, one has only to note the headings of the reports to appreciate the complete and thorough character of the survey. The town selected was Taytay in the province of Rizal, with a population of 6000 and a death-rate varying from 27·91 per 1000 to 45·42 per 1000: it had a bad record from a sanitary standpoint. The reports dealt with the following subjects: Geology and Water-supply of Taytay; Bacteriological Analysis of the Water-supply; Chemical Analysis of Taytay Waters; Principal Foods Utilised by the Natives; The Food of the People of Taytay from a Physiological Standpoint; Mosquitoes and Other Insects; Vital Statistics; General Sanitary Conditions; Animal Parasities of the Intestine; Examination of the Blood, with Special Reference to Malaria; Filariasis, Malaria, Tuberculosis, Typhoid Fever, Goitre, Beri-beri, Venereal and Skin Diseases; Disposal of Excreta; and Table of Physical Examinations.

All these interesting papers, covering in the minutest detail the work of the different branches of the survey, have been reviewed and summarised by Dr. R. P. Strong, chief of the Biological Laboratory, Bureau of Science, Philippine Islands. It was the intention during the survey not only to observe how much sickness there was present and the nature of such sickness, but to examine into the character of the population, the conditions under which the people lived, the food which they ate, the water which they drank, and the diseases to which they were liable to be exposed. Anthropometric measurements were performed, and in the case of any of the inhabitants who were found at all sick or abnormal a medical history was taken and a physical examination performed; the blood, fæces, and sputum were examined microscopically, and in many cases where the nature of the complaint warranted serum reactions, differential blood counts, and examinations of the urine were made. A dispensary was established at which all of the cases of disease thus discovered were treated free of charge. A census was also taken and in the course of this work the entire town was covered by a house-to-house inspection, the name, age, and sex of each inhabitant, together with the surrounding conditions under which he lived, being entered upon a separate card for each house. The members of the expedition were able by means of this census to locate cases of serious or interesting diseases which otherwise might not have come to their attention. In some cases a person afflicted with a disease was able to direct the members of the expedition to other persons similarly afflicted, thus assisting in the discovery of all cases of disease in the town. This was particularly true in regard to goitre and yaws diseases, which the people could recognise easily. A laboratory and a clinic were established and the plan of work was outlined as follows. To each individual who presented himself a ticket bearing his name was given, and a number, together with the name, sex, age, occupation, and residence of the individual, was placed upon a clinical record card. A separate alphabetical index of names was kept in order to avoid error if a ticket were lost. Each person was then supplied with a test tube or bottle, in which he was instructed to bring a specimen of his fæces on the following day. As many as could be examined were then passed to another room, where they were subjected to a physical examination. A hæmoglobin estimate and examination for malarial or other parasites were made of the blood. The results of the examination were entered on the clinical card, and in addition separate records were kept of all laboratory examinations. If an individual proved of any particular interest from a medical standpoint he was detained for other examination; otherwise he was discharged, or if sick was sent with his clinical card to the dispensary for treatment. The difficulties in carrying out the investigations were not so great as had been anticipated; the people throughout the town took considerable interest in the work, and there was comparatively little difficulty encountered in making the various physical and blood examinations, &c.

In relation to the entomological study of the town two new species of mosquitoes were met with, both belonging to the genus Culex. Mosquitoes of the sub-family anophelinæ (Myzomyia rossii Giles) were found breeding, particularly in the districts of the town along the banks of streams and in all bodies of stagnant water around the wells; they were most numerous along the stream running through the town. It is interesting to note that the distribution of the anophelinæ, as found by the entomologist, corresponded very well with the districts in which the cases of malaria were discovered by the clinicians. An examination of the fæces of 1000 persons in the town showed that 95 per cent. of the people were infected with some form of intestinal worm. In Manila it has been found that Filipinos are almost universally infected with these worms. An attempt to discover any localisation in groups of the cases infected with ascaris, hookworms,

trichuris, strongyloides, oxyuris, or amœba in any part of the town of Taytay in proximity to any wells or streams by families or occupations gave negative results. Only 11·6 per cent. of those examined were found to harbour hookworms, 82 per cent. had ascaris, and about 77 per cent. trichuris. About 1 per cent. were found to be infected with tuberculosis; 1 per cent. had goitre. Only a very small amount of venereal disease was observed, while, on the other hand, yaws was fairly prevalent, 1 per cent. of the children being infected. Epidemics of cholera, typhoid fever, and bacillary dysentery occur from time to time. Only about 2 or 3 per cent. of those examined in Taytay were found to be harbouring the malarial parasite, but this is not surprising, since the investigations were carried on in the midst of the dry season, when malaria is at a minimum. Mosquito nets were used practically not at all in the town, only about half a dozen having been seen by members of the expedition. In regard to small-pox, general vaccination against this malady was carried out in 1905 and in March, 1909. It is interesting to note in this connexion that small-pox was present in 1908, and 1 per cent. of the inhabitants died with it. The entire mortality of the year was 45 per 1000. In 1907, when there was no small-pox, the death-rate was 27 per 1000. Practically all the deaths from small-pox were among children under nine years of age—that is, the majority of the children who died from the disease were born after the general vaccination performed in 1905, and therefore unvaccinated. This expedition is probably the most extensive medical survey that has ever been undertaken. Its value may be gathered from the summary of Dr. Strong in the *Philippine Journal of Science*, and the conclusions arrived at for the amelioration of the undesirable conditions found.

In addition to the periodical despatch of small expeditions to our African protectorates and colonies for the study of one disease, might it not be possible for our two leading schools of tropical medicine to bring together a British medical expedition for the combined investigation of the conditions of life in some populous centre in the hope that the various examinations made synchronously would elucidate much that remains as yet unknown with regard to the general status of the people, Europeans and natives alike, their average health and sickness, their surroundings, and the pests to which they are exposed? The conditions of life in one town are similar in many respects to those of other towns and villages in the same belt of country, and much might be gathered from a comprehensive study such as that which has been undertaken, and successfully carried out, by the Philippine Government.

BIRMINGHAM.

(FROM OUR OWN CORRESPONDENT.)

City Analyst's Report.

DURING 1909 2855 samples were submitted to analysis. Of these, 2105 were taken under the provisions of the Sale of Food and Drugs Acts. Of the 2105 samples 1954 were genuine, 19 contained preservatives only, and 132 were adulterated in other ways; 850 samples sold as "milk" and 5 sold as "separated milk" were analysed. The samples of separated milk were all of uniform composition and complied with the Board of Agriculture regulations. Of the 850 "milk" samples 7 were adulterated with boric acid and 3 with formic aldehyde; 5 of the samples containing boric acid were sold by one wholesale dealer who was prosecuted and fined £15; 64 samples were deficient in fat or other solids. 782 samples of butter, 4 samples of margarine, and 5 samples of proprietary-name butter were analysed; 49 samples of butter contained foreign fat and 2 excess of water, and 16 prosecutions were instituted.

Queen's Hospital.

Dr. Leonard G. Parsons has been elected to the post of honorary pathologist. Dr. Parsons, who received his medical education at Birmingham, and was formerly house physician to the late Dr. Foxwell, has recently held the post of casualty officer at the Hospital for Sick Children, Great Ormond-street, London.

The Late Mr. F. V. Milward.

The General Hospital has received a severe loss by the early death of Mr. F. V. Milward, who occupied the posts of assistant surgeon and surgical registrar. He was a hard-working officer, who did not spare himself in advancing the interests of the hospital, and had already gained a considerable reputation as an operating surgeon.

April 12th.

MANCHESTER.

(FROM OUR OWN CORRESPONDENT.)

The Conquest of Consumption.

SUCH was the title of an address delivered by Dr. Arthur Latham at the annual meeting of the Manchester and Salford Sanitary Association. The title was chosen to impress on his audience the fact that many who were daily brought in contact with the disease held that it was possible to eradicate consumption from our midst within a generation. He said that the cause was known, the disease could be prevented, it could be detected, and could be cured. Nor was it hereditary, though some were more susceptible of infection than others. One part of the tasks of conquest was to raise the standard of health of the community by dealing with slum property and overcrowding. This, of course, would be most desirable, but it seems very doubtful if slums and all their evils can be got rid of in a generation, seeing how many generations have been taken to bring them into their present state and while human nature, not altogether perfect, remains what it is. However, by all means let the effort be made. He pointed out that milk and butter were frequent sources of infection, and that to prevent this it was enough to heat all milk to 140° F. for 20 minutes. The sale of milk containing tubercle bacilli should be made a criminal offence. He laid stress on the necessity for early detection and advocated the establishment of anti-tuberculosis dispensaries, which were cheap, and detected the disease in a curable stage. He spoke well of sanatorium treatment, and made out by some rather elaborate figures that the cost of the treatment of all the consumptives of the country would be less than the present cost of the disease. Education and organisation were necessary, with many other things that presuppose a sane determination on the part of the community to deal with this scourge. The education of the community will be one of the most difficult tasks. It was necessary to organise a pure milk-supply by inspection of farms and dairies, by rigid enactments as to the sale of milk, butter, and cream, and by the supply of milk from healthy cattle or in pasteurised form. "An efficient anti-tuberculous dispensary for every 300,000 persons should be organised, and in Manchester the cost for two would not be more than £1000 or £1500. They would also want to organise certain open-air schools; and a sufficient supply of sanatorium beds, with arrangements for the payment of the wife and family when the breadwinner was away regaining health. Most of this could be done at a little cost per head. If Manchester and other municipalities would take the matter up they would be astonished at the results of a few years' hard work and coöperation." Dr. Latham sketched the outline of a most noble crusade, though the carrying of it out will be hard. From the report of the Manchester and Salford Association it would seem that the corporation recently lost the chance, "in consequence of delay in dealing with it," of acquiring a property very suitable for a Manchester sanatorium. As is the case with many societies having the good of the community for their object, the Manchester and Salford Sanitary Association is not supported with sufficient generosity, and this is not creditable to either the humanity or the judgment of the Manchester people.

Medical Missions and the Poverty of Medical Men.

On April 8th Mr. Andrew Boutflower, senior honorary surgeon to the Salford Royal Hospital, presided over a public meeting held in the Manchester Memorial Hall on behalf of the Medical Mission department of the Society for the Propagation of the Gospel. He thought that every medical missionary should be in Holy Orders, though this, of course, could not apply to the female medical missionaries, who alone in many lands can gain access to their sisters. But he did not think they could reasonably expect much pecuniary support from the medical profession. They heard a great deal nowadays about the poverty of the clergy,

but the poverty of medical men was as bad and was gradually getting worse. If the incomes of all medical men were pooled he did not think the average would come to more than £200 a year. Dr. Lucy Pinniger (Oldham) said that in her visits to schools in the course of her duties she saw among the children much suffering from misery and disease arising from parental ignorance, and if this occurred in England how much it must be intensified in countries like India, Africa, and China. There was an appallingly high death-rate of women and children in India, and it could only be put an end to by medical missionaries, particularly by women medical missionaries. This certainly is a field in which qualified medical women may do good work. The Rev. J. Anderson Robertson, secretary, also spoke on behalf of the cause.

The Infirmary.

The amount received from the Manchester and Salford Hospital Saturday and Convalescent Homes Fund this year is £693 16*s.* 6*d.* The medical board has forwarded a resolution to the board of management to the effect that the Central Branch should be provided with beds, and the former board suggests that there should be 12, to be divided into six wards. A statement appeared a short time since in a local paper as to the income of the infirmary, which the chairman, Sir William Cobbett, said was not quite accurate. The actual income was £27,616, but the expenditure instead of being as stated (£27,382) was £35,494. This unfortunate disproportion between income and expenditure is too common with most of our medical charities.

Rivers Pollution.

A meeting of the Mersey and Irwell joint committee was held on April 5th, when Mr. Scudder, the chemical adviser, reported that of 38 samples of sewage effluents from the works of local authorities, 16 were good, 12 fair, 5 unsatisfactory, and 5 bad. After all the years during which the work of purifying our rivers has been going on, this does not seem a very triumphant result. One feature is that some of the most powerful authorities seem to be either careless or obstructive. The clerk was instructed to write to the Manchester corporation, the Bolton corporation, and the Tyldesley urban council "with reference to the unsatisfactory character of the effluent obtained from certain of their sewage works." "Unsatisfactory" must be a very familiar word to the clerk.

Epidemics in Cheshire.

Rather serious outbreaks of sickness have been occurring recently among school children in the districts about Altrincham and Sale. Mumps has been prevalent at Ashley and measles at Northenden, and Mr. T. W. H. Garstang, the county school officer of health, has received a letter from the rector of Mobberley asking him to close the schools there as there were a hundred cases of measles in the parish. Both mixed and infant schools have been closed.

April 12th.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

Extension of Medical Teaching in Glasgow.

AN inquiry under the Private Legislative Procedure (Scotland) Act, 1899, was held in the New Justiciary Court, Glasgow, last week, into the Provisional Orders promoted by the University of Glasgow, the Muirhead trustees, and the governors of St. Mungo's College. The three orders being inter-related were heard by the Commissioners as one group. The University order sought to alter the constitution of the deeds of endowment of the two chairs of clinical medicine and clinical surgery in the University. These, it was proposed, would be transferred to the Royal Infirmary, at which the professors would give both systematic and clinical instruction to students of the University without distinction of sex. Under the Muirhead order power was sought to abrogate the scheme prepared by the Muirhead trustees and approved by the Court of Session in 1889, by which it was intended to build and equip a college for the education of women by women, the changed circumstances brought about by the Carnegie Trust endowment in favour of Scottish Universities having rendered the proposed college unnecessary in the public interest. The St. Mungo's College order was also necessitated by the same changed circumstances in medical education. By the complete scheme which was proposed, the two clinical chairs in the University, the emoluments of which amount to £112 a year, would be increased by the payment by the Muirhead trustees of £400 to the chair of medicine, to be known in future as the Muirhead chair of medicine; and by the payment of £400 by the St. Mungo's College to the chair of surgery, to be known in future as the St. Mungo's chair of surgery. Two other chairs to be founded by the Muirhead trustees and the St. Mungo's College respectively were a chair of obstetrics by the Muirhead trustees of £400 per annum, and a chair of pathology by the St. Mungo's College of £600 per annum. The four new professors would teach at the Royal Infirmary and be members of Senate of the University and examiners in their subjects. The Muirhead trustees were also to make a grant of £1200 to the Glasgow and West of Scotland Technical College for a women's common room, cloakroom, &c., and were further to found four scholarships for women of £35 each. In addition to this the trustees were to found post-graduate scholarships of the value of £50 each at the Royal Samaritan Hospital for Women and the Royal Hospital for Sick Children. Dr. D. C. McVail, a governor of the Victoria Infirmary, objected to the Provisional Orders on the ground that they proposed to found at the Royal Infirmary a fragmentary medical school, as against a complete medical school at the Victoria Infirmary as intended by the late Dr. Muirhead. Dr. Marion Gilchrist, the first woman to get a medical degree from any Scottish university, objected on the ground that this scheme did not bring any nearer what those interested in the medical education of women had been striving for—viz., equal teaching with the men. According to Dr. Gilchrist, Dr. Muirhead had intended that women under his scheme should have house-surgeonships in the hospital with which his proposed college for women was to be affiliated, but if the present scheme were passed they would not get such posts. If the scheme were thrown out she thought it would improve the women's chances of getting into Gilmorehill, because in the two Universities in Scotland where women had no separate college they got straight away into the Universities. After the Commissioners had listened at considerable length to those for and against the scheme they found the preamble to the three Provisional Orders proved.

Glasgow Maternity Hospital.

The annual report of the Glasgow Maternity Hospital which has just been issued states that 4734 cases have been treated in the hospital and branches during the past year, being an increase of 350 over the previous year and almost 1000 over the total for 1907. The year's work has demonstrated the thorough suitability of the new hospital. The directors had intended to convert the adjacent old hospital building into wards and theatres suitable for gynæcological work. They had, however, been advised that it would be more economical and more efficient to convert the old hospital buildings into a home for nurses. This rearrangement would leave plenty of beds for maternity work and afford a sufficient number for gynæcological cases. The cost of the alterations on the former buildings was estimated at about £2000. This, added to the balance of the cost of the new buildings still unpaid, made the amount of capital still required £22,000.

School Medical Officer for Paisley.

The Paisley school board recently unanimously appointed Mr. Andrew Gilmour, M.D. Edin., D.P.H., assistant and deputy medical officer of health of Paisley, school medical officer of the burgh. The salary is £350, rising biennially by £25 to a maximum of £400.

Honour to a Perth Practitioner.

Dr. David H. Stirling, the oldest medical practitioner in Perth and founder of the Perth City Mission, was made the recipient of an illuminated address on the occasion of the mission's jubilee. Considerably over 80 years, Dr. Stirling has given up general practice, but he still takes an active personal interest in The Hillside Homes, which were established mainly by his exertions.

Regimental Gift to Montrose Infirmary.

The officers of the now disbanded Forfar and Kincardine R.G.A. (Militia), a regiment which had its headquarters in the town from its inception over 50 years ago, have decided to give the Montrose Infirmary certain funds, amounting to

£211 8s. 6d., to be used for the benefit of any old members of the regiment who may require treatment at the institution.

April 12th.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

The Apothecaries' Hall of Ireland and the General Medical Council.

AT a meeting of the General Medical Council in November, 1909, the education committee reported upon an application from the Apothecaries' Hall of Dublin that its preliminary examination should be recognised by the Council in a favourable sense. The report of the education committee stated that it in no way wished to discourage the legitimate efforts of the Apothecaries' Hall, but the committee did not consider it right that a body concerned purely with medical education should conduct a preliminary examination in general education. The Apothecaries' Hall of Ireland consequently addressed the Privy Council praying that the General Medical Council might be directed to re-schedule the preliminary examination of the Hall as sufficient for registration in the Medical Students Register. To this the Privy Council has replied that the power of the Privy Council under Section 19 of the Medical Act, 1886, to notify their opinion to the General Medical Council is limited (apart from the specific cases mentioned in the opening part of the section) "to cases in which the Council fails to exercise any power or perform any duty or do any act ..... imposed on or authorised to be done by the General Council under the Medical Acts." The Privy Council further points out that inasmuch as neither the establishment of a register of medical students nor the recognition of particular examinations in general education as qualifying medical students for registration therein is an "act or thing vested in or imposed on or authorised to be done by the General Council under the Medical Acts," the subject matter of the petition does not fall within the purview of the Council.

Workmen's Compensation Act in Ireland.

Dr. T. S. Kirk, one of the medical referees under the Workmen's Compensation Act, introduced last week before the Ulster Medical Society a discussion on the Workmen's Compensation Act, in which he dealt with the question under three heads—(1) the workman, (2) the employer, and (3) the insurance companies. He showed that decisions such as that in the recent "aneurysm case," the case of "heat-stroke," and other well-known cases in which, on appeal, the House of Lords decided they were accidents, were completely altering our ideas as to what an accident was legally, and it was a significant fact that in the most recent text-books on surgery writers were more chary of saying (as was done formerly so often without sufficient proof) that a given surgical condition was caused by an accident. The legal definitions of accident recently established were making insurance companies feel that they must raise their premiums, while, on the other hand, employers were deciding that before hiring anyone to work they must be medically inspected, and workpeople would soon be considered old at 45 years of age. It was also clear that the Workmen's Compensation Act, as at present being carried out, must lead on to State sickness insurance; and it was also likely that the insurance companies, in cases of accidents, would not rely so much as formerly on hospital surgeons at whose institutions the cases were treated, but would employ specialists paid by themselves to attend those injured, and who when necessary would give evidence. From the debate which followed it is clear that great dissatisfaction prevails in medical circles as to the way the Workmen's Compensation Act is being administered—either it will have to be altered or the alternative is State Insurance. Many medical men object to be badgered in the witness-box or to be asked to swear exactly as to what are after all pure probabilities, and it will soon arise that those medical men whose opinion would be of the greatest value will not put themselves in the way of giving evidence. The best method would be for both sides to allow the medical men to consult together and come to an agreement as to what they considered was the fair view of the case, but to this, presumably, the legal profession would never agree.

Poor-law Administration.

Considerable interest is being taken in Belfast in the projected changes in the Poor-law system, and an association has been formed for the discussion of questions relating to Poor-law reform. In Ireland no part of this question is more important than that of medical relief as it interests both the poor and the profession, and both the Irish Medical Association and the Irish Committee of the British Medical Association are taking a plebiscite of the Poor-law medical officers as to what plan they would regard as best for dealing with the matter—in other words, should the medical service under the Poor-law be a State one, entered by examination and paid out of the Consolidated Fund; or a county medical service; or should it remain unaltered with the addition of compulsory superannuation on retirement?

Trypanosomiasis and Sleeping Sickness.

At a meeting of the Belfast Natural History and Philosophical Society on April 6th Professor St. Clair Symmers gave an interesting popular lecture on the above subject, very fully illustrated with lantern slides. At its conclusion he was accorded a hearty vote of thanks from the large audience which was present to hear him.

April 12th.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Congress of Medical Practitioners.

AT the Congress of Medical Practitioners, which has just concluded its sittings in Paris, the president of the committee of organisation opened the proceedings with an address, the election of officers followed, and the reading of papers then commenced. Among the more important communications mention may be made of one by M. Marro on irregular admissions and registrations in the medical schools, and one by Dr. Tourtourat on the limitation or non-limitation of students in the medical schools. The authors and subjects of the other principal papers were as follows: Dr. Bolliet, on free choice and the mutual aid societies; Dr. Vallat, on free choice of doctors and industrial undertakings; Dr. Bresselle, on the increase of medical fees; Dr. Bertillon, on abortion regarded from a medico-legal point of view; Dr. Levassort, on the illegal practice of medicine; Dr. Lafontaine, on medical unions and medical teaching; Dr. Le Fur, on the Superior Medical Council; Dr. Delpeut, on competitive examinations for admission to the medical schools; Dr. L. Archambault, on hospital administration in France and other countries; Dr. Duclercq, on the administration of the public health services in foreign countries; Dr. Wicart, on the law of 1902 with reference to public health; Dr. Maurice Faure, on the present state of physical education in France; Professor Kutner of Berlin, on supplementary medical teaching in Germany; Dr. Koenig, on hospital and nursing organisation in the United States of America; Dr. Kolbe, on hospital administration in Germany; and Dr. Campinchi, on the relation of medical unions to public health questions.

A Franco-Belgian Medical Convention.

The French and Belgian Governments, by successive arrangements concluded between the years 1895 and 1909, have sanctioned reciprocity of notification by the local authorities on the respective frontiers in cases of epidemic disease reported in the districts of such authorities, the object being to improve the sanitary and medical supervision of the districts in question. It is announced in the French *Journal Officiel* that the diseases notifiable under this system are Asiatic cholera, plague, typhus fever, typhoid fever, small-pox, scarlet fever, diphtheria, measles, dysentery, contagious ophthalmia, puerperal fever, cerebro-spinal meningitis, and in general all epidemic and transmissible diseases. A similar convention has been entered into with respect to some infectious diseases of animals. The French departments in which the new system will take effect are the Nord, the Aisne, the Ardennes, the Meuse, and the Meurthe et Moselle, the corresponding Belgian provinces being West Flanders, Hainault, Namur, and Luxembourg.

April 12th.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

Pellagra in Hungary.

A RECENT report of the Public Health Service of Transylvania (the south-eastern part of Hungary) announces the appearance of pellagra, which is spreading rapidly. As generally held, the disease is due to eating damaged maize, and the prevalence of it is not surprising in view of the fact that maize is the staple food of the peasantry in this part of Hungary. The maize is rendered unwholesome by the modern intensive method of cultivation, the grain being harvested while still unripe, with the result that putrefaction occurs. In parts of Italy, especially in Lombardy and Piedmont, and also in Roumania, pellagra is even more common than in Hungary. The Government of Hungary has distributed wheat flour among the indigent inhabitants of South Hungary, who are chiefly peasants of Roumanian origin. The disease itself is by no means severe, though some patients suffer from mental disturbance which does not yield readily to treatment. Many cases of pellagra recover when supplied with wholesome food.

Typhus Exanthematicus in Budapest.

In 1908 some cases of acute febrile illness which occurred in Budapest perplexed even the hospital experts on account of the unusual character of the eruption, and in the result such patients as presented these symptoms were isolated in the hospital for infectious diseases. Here Dr. Gerlocsy, director of the institute, at once recognised that the patients were suffering from typhus exanthematicus and accordingly advised the municipal authorities to issue strict rules for the isolation of all the cases. This energetic action had a good effect, and in June, 1908, the last case was discharged from the hospital. From that time no case was notified until Jan. 8th of the present year, since which date all suspicious cases have been conveyed to the St. Gellert Hospital. Disinfection of places that have been occupied by patients is carried out as far as possible, but the want of sufficient disinfecting apparatus and of a skilled staff is a great obstacle. This work is, as a rule, undertaken by order of the local magistrate, and in that case no charge is made to the public. The usual disinfectant is formaldehyde, employed in the state of vapour or spray. Portable personal belongings are disinfected by means of high-pressure steam in special apparatus, of which there are at present four very large plants available in Budapest.

Ice Production, Natural and Artificial.

The uncommon mildness of the winter, during the whole of which there were only two cold days, threatens us with an ice famine. The seriousness of the situation thereby created may be best understood from the fact that all the town magistrates have petitioned the Minister of Public Health to establish State-aided ice factories. Budapest alone needs 60,000 centen (6,000,000 kilogrammes) of ice in a single summer day. The ice factory in connexion with the slaughter-house and one private company are able to supply only 10,000 centen—i.e., one-sixth of the total demand. Hitherto there has been a sufficient supply of natural ice gathered in winter from artificial lakes, because from a hygienic point of view river ice is unfit for use. The hospitals of Budapest have resolved to establish a separate ice factory capable of supplying their own needs as well as those of the other medical institutions and of the apothecaries. The hotel-keepers have also formed a limited company to ensure a sufficient quantity of ice for their requirements. Provincial towns intend to raise money to establish refrigerating machinery in connexion with their slaughter-houses. The ice famine will naturally have its sad consequences, chiefly to be felt by the poorer classes. In Budapest some private companies have formed a trust to raise the price of ice by about 80 per cent., and certain Members of Parliament have thereby been led to put questions to the Minister of Public Health on the subject. In towns and in the larger villages it will be possible to procure ice at a considerable cost, but the butchers and other traders in villages will probably be placed at some disadvantage.

April 11th.

CANADA.

(FROM OUR OWN CORRESPONDENT.)

The Ontario Medical Council.

THROUGHOUT the province of Ontario there has been manifested lately a great deal of unrest in the medical profession owing to the manner in which the governing body of the profession has conducted affairs, as well as considerable dissatisfaction with the constitution of the council. The contention has centred around the composition of the council, on which there remain several representatives of so-called university bodies which only exist on paper, as they have either long since abolished their medical teaching faculties or even in some cases given up their degree-conferring powers. It is felt that but three universities—namely, Toronto, Queen's, and the Western University at London—should have representatives on the council, each of these three having an active teaching faculty in medicine. The West Toronto District Doctors' Association met on March 1st and unanimously adopted resolutions looking to a correction of the existing abuses and affirming their belief in this principle. The meeting also favoured the revision of the entire representation of the council, reducing university representation as above, the territorial representatives from 17 to 9, and the homœopathic from 5 to 2. Apparently, too, the Ontario Medical Council is spending far too much money, as its capital account has recently been drawn upon to the extent of some $10,000. The meeting called for a full exposition of the finances of the council.

Rabies in Ontario.

There has been a widespread outbreak of rabies all over the western portion of the province of Ontario. Some three years ago a small rabid dog ran across the International Bridge at Buffalo into Ontario and bit other dogs, and from that time to the present isolated cases have from time to time been reported. Gradually cases grew in numbers until a few weeks ago the federal and provincial authorities united to issue an order requiring all dogs to be muzzled or kept on the chain. Some 50 people bitten by dogs have had to go to New York for treatment at the Pasteur Institute. This necessarily involved considerable expense, so the Ontario Government sent Dr. Hodgetts and Dr. Amyot of the Provincial Board of Health to New York to study the treatment. Now these cases are being treated in the Toronto General Hospital and the Hospital for Sick Children, Toronto. So far there has been only one case of hydrophobia, a boy aged ten years, who died recently in the Hamilton General Hospital, the only case in Ontario in the remembrance of the present generation of physicians. All the patients who underwent the treatment in New York so far have recovered.

Montreal General Hospital Extension.

Work has been commenced on the reconstruction of the Montreal General Hospital, and when completed it will be one of the finest structures of its kind in Canada. The extension will include 38 additional private wards and accommodation for some 80 extra beds in the three new public wards. There will be accommodation for 28 extra "semi-private" patients, and the present capacity of the hospital (about 250 beds) will be pretty nearly doubled. A new operating theatre will be constructed which will be modern in all its appointments, and in connexion therewith there will be an assembly room and lecture room. Directly opposite the hospital a large vacant plot has been secured for conversion into a pleasant flower garden.

Medical Education in Toronto University.

In his report to the governors of Toronto University the Dean of the Medical Faculty states that the candidates for the final examinations, during the last two years especially, were not properly equipped and that better methods of teaching are necessary. These facts have been generally known throughout the province, and a year ago at the Ontario Council examinations there was a great deal of complaint at the number of candidates who were "ploughed." The dean is giving careful consideration to the subject. The *Canadian Practitioner and Review* commends the frankness and honesty of the dean in giving the matter publicity. A writer in the same journal considers that it is a serious mistake to appoint juniors to positions as clinical teachers in practical subjects,

and that too many of the older and more experienced men have been laid on the shelf. He thinks also that it is a mistake to allow the didactic lecture to go by the board.

April 1st.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENTS.)

Plague.

THE plague returns for the week ending Feb. 26th show 18,992 deaths for all India and Burma as compared with 18,922 for the week preceding. The Bombay Presidency reported 1043, Bengal Presidency 2367, the United Provinces 7936, the Punjab 3697, the Central Provinces 1583, Rajputana 1833, and Burma 357. For the week ending March 5th similar returns give 21,514 deaths for all India and Burma, of which Bombay Presidency reported 1008, Bengal Presidency 2554, the United Provinces 8260, the Punjab 6227, the Central Provinces 1300, Rajputana 1708, and Burma 300.

A Discussion on Plague at the Viceroy's Representative Council.

The new Councils discuss many subjects, and it was not likely that plague would escape notice, for there are some critics who hold the Government responsible for all the ills that afflict the people of India. When, however, it comes to assertions that official shortcomings in the matter of sanitary improvements are responsible for the prevalence of plague, and that Europeans escape the disease because their welfare is more closely regarded than that of the people at large, it is time for plain speaking. In the Viceroy's Legislative Council at a recent meeting the Director-General of the Indian Medical Service had to traverse statements of this kind, and his remarks should have some effect in influencing public opinion. Surgeon-General Lukis follows the highest scientific authorities in tracing the causation of plague to the rat and the rat flea, and shows that the question is one of domestic hygiene and not of general sanitation. The "domestication" of the rat must be discouraged in every way, for so long as it remains a house-dweller so long will the danger of plague continue. At present the rat is encouraged to live in and near houses by reason of grain being stored in the rooms, by scraps of food being carelessly thrown about, and by rubbish being allowed to accumulate in which nests can be made. Sanitary measures pure and simple will not act as remedies so long as these conditions are allowed to continue. Such measures are good in their way so far as the general health of the people is concerned, but they will fail to check epidemic plague. Europeans in India enjoy practical immunity from the disease because the rat is never permitted to gain a footing in their houses. The Japanese have stamped out plague by an extraordinary campaign against rats. When the dwellers in Indian cities and villages will listen to the oft-repeated warnings that the rat and the rat flea are their most dangerous enemies, plague in epidemic form at least will die out. In the Viceroy's Legislative Council the Honourable Pandit Mohan Malaviya and Mr. Bhupendra Nath Basu, both representative members, laid stress upon the fact that Europeans in India escape the ravages of plague, whereas the Indian population suffered terribly owing to the failure of Government to carry out a policy of sanitary improvement. The reply given by Surgeon-General Lukis is worth reproducing in full. He said: "I did not intend to speak on this occasion, but I feel bound to correct the misapprehensions under which the hon. members who have last spoken are labouring with reference to the causation of plague. They infer that the reason why Europeans escape this fell disease is that they are living in more sanitary surroundings than those which obtain in Indian cities and villages. Now, sir, if there is one thing that we have learnt in the last 13 years it is that plague has nothing whatever to do with pollution of the soil, contamination of water-supply, or defective drainage, and large sums of money have been spent by Government without any effect as regards the checking of the disease. Recent discoveries have proved that plague is essentially a disease of rats, and that the medium of communication between rat and man is the rat flea. What happens when plague breaks out amongst human beings is this. First of all the rats are attacked. So soon as this happens they begin to run away from the infected house, but in so doing they leave their nests behind them and in these nests a large number of rat fleas. Now, ordinarily the rat flea will not bite human beings, but when no rats are forthcoming they are forced to do so, and thus they convey the infection to the inhabitants of the house and a plague epidemic is started. It is obvious, therefore, that the question of the prevention of plague becomes one of domestic hygiene. What is wanted is to teach the Indian public the danger of allowing the rat to remain a domestic animal, and to advise them to try and prevent this by giving up the habit of storing grain in the house, throwing remnants of food about in its vicinity, and by allowing collections of rubbish behind which rats can make their nests. So long as the rat remains a house-dweller so long will the danger of plague continue; and until this fact is appreciated it is useless for Government to squander large sums of money on sanitary improvements of doubtful value. I wish, however, to state distinctly that I must not be understood as deprecating sanitary improvements on general lines. I merely wish to point out that, as regards this particular disease of plague, it is the habit of the people and not the want of care on the part of Government which is largely responsible for the persistence of the epidemic."

March 19th.

NEW ZEALAND.

Annual Report of the Public Health.

IN his report the chief health officer (Dr. J. M. Mason) draws attention to the steady advancement which is being made towards the provision of open-air shelters for the indigent consumptive. Ever since the Department of Public Health of New Zealand was set up in 1900 the campaign against tuberculosis has been carried on most vigorously. The hospitals in New Zealand, as in most of the colonies, are supported partly from the local rates and partly from the consolidated revenue. The State established in 1902 a very fine sanatorium, capable of accommodating about 62 patients, and in most of the hospital districts there are fine annexes for the reception of cases of consumption. In the Christchurch and Wellington districts elaborate and up-to-date sanatoriums have also been provided. Good work appears to have been done at a tree-planting camp which was established for "cured" consumptives. The planting is done under the supervision of the Lands Department, and the men receive 8*s.* for planting 1000 trees. The camp is almost self-supporting and the Government has a first lien upon the worker's wages for the cost of his keep, &c. This is an excellent State experiment and already "several who have been 'hardened off' at Karere have gone back to their ordinary work quite recovered." There would appear to be the same difficulty in providing work for the "cured" consumptive in this Britain of the South as there is in England. Speaking of this Dr. Mason says: "Only those in intimate contact with the lives of the men and women who pass through our sanatoria know what a 'hopeless dawn' the day they leave the institution often seems to the 'cured.' Though well, they are debarred by reasons of prudence from engaging in indoor work, and their physical condition does not permit of their competing in the open mart of unskilled labour. What are they to do? Friends tire of keeping them, the lodging-house-keeper is sorry but his other clients complain, and so they must seek shelter where their neighbours are less exigent. This shelter they find only amongst the poorest. Ill-fed, poorly clothed, dispirited at the non-finding of work, he soon falls back, his cough returns, and—to put it briefly—all the money, care, and skill that has been expended upon him is, from a public health point of view, wasted. It would have been cheaper, nay, in some senses it would have been kinder, to have shut the door upon him when he first knocked." Suitable work for the "cured" is undoubtedly the great problem.

The birth-rate increased by 3·37 per cent. in 1908 over that of 1907. New Zealand once again holds the enviable position of having the lowest death-rate almost in the world—namely, 9·57 per 1000 persons living. The principal causes of death were: cancer, 6·95; tuberculosis (general), 8·97; and accident, 6·03.

Another case of leprosy was reported. The patient is a

Maori. There are now some three cases known amongst the Maoris and one in a white man. There would appear to have been no epidemic of any severity in the Dominion in 1908, although there was a severe outbreak of enteric fever in Gisborne. This, however, was traced to the generally insanitary condition of the town. According to Dr. Pomare, the native health officer, cancer is a rare disease amongst the Maoris, but tuberculosis claims many victims. A great deal of valuable work has been done amongst the natives and many of the old insanitary "whares" have been replaced by up-to-date houses. Some interesting observations on the height and weight of the boys attending the Wanganui school and of the girls attending the High School in Dunedin appeared in the last report. Further data have been collected by Dr. J. S. Purdy with respect to Auckland. It seems a great pity that there is no general examination of the scholars attending the schools. It would be most interesting to see the result upon the race of the climatic and social conditions which obtain in young countries like New Zealand. Generally speaking, it would seem that the young New Zealander is, age for age, taller and heavier than his compeer in England. This statement has, however, to be accepted with some reservation because of the small amount of data at the command of the chief health officer. It would appear that the European boy starts (at 10 to 11) a little taller than the Maori, but nearly seven pounds lighter. In the matter of height the Maori still gains upon the European until the age of 15 to 16 is reached, when the heights are equal. The weight of the Maori is maintained about equal, until at the ages of 13 and 16 years the Maori boys are one stone heavier than the European.

A large amount of valuable work was done in the various laboratories both in a chemical and bacteriological way, but vaccination and democracy would appear not to walk hand in hand. The returns for last year show that only 4·7 per cent. of the children born had been vaccinated, and this despite the ardent advocacy of the health officials. Some day the Dominion may regret this. In thanking the various officers Dr. Mason intimates that he has resigned the position of chief health officer—a post which he has held since the inception of the department in 1900—to take up that of consulting medical officer to the New Zealand Government in London. Dr. Pomare, in his statement upon the "sanitary conditions of the Maori," which is included in this report, pays an eloquent tribute to the appreciation felt by the natives for the altered conditions wrought in their lives by the Health Department under Dr. Mason's captaincy.

Obituary.

FREDERIC VICTOR MILWARD, M.B., B.C. CANTAB., F.R.C.S. ENG., L.R.C.P. LOND.

WIDESPREAD regret is felt at the death of Mr. F. V. Milward, which occurred at his house at Edgbaston on March 31st after a few days' illness from pneumonia following influenza. Mr. Milward was the second son of the late Colonel Victor Milward, a member of the well-known Redditch needle manufacturers, and was in the fortieth year of his age at the time of his death.

Born at Redditch and educated privately until he entered Clare College, Cambridge, he took the degrees of B.A. Cantab. in 1891 and M.B., B.C. at the same University in 1895. In the same year he also qualified as M.R.C.S. Eng. and L.R.C.P. Lond. He completed his curriculum at St. Thomas's Hospital, where he held some minor appointments. His first resident appointment was that of house surgeon at the General Hospital, Birmingham, in 1896. From there he went to the Seamen's Hospital, Greenwich, returning to the General Hospital in 1898 as resident surgical officer. He afterwards held the posts of casualty assistant surgeon, assistant surgeon, and surgical registrar and junior surgical tutor at this hospital. He obtained the F.R.C.S. Eng. in the year 1900. Shortly after this he was elected resident surgical officer at the General Hospital, Birmingham. Here he remained for some three years and was afterwards appointed one of the assistant surgeons to the hospital. He also held the posts of surgeon to the Orthopædic Hospital and surgeon to out-patients at the Children's Hospital, Birmingham. In his many positions he discharged his various duties with credit to himself and to the satisfaction of the committees of the various public institutions with which he was associated. In 1906 Mr. Milward published a work upon "Diseases of the Rectum," and also contributed to the study of allied subjects to various medical periodicals. A paper on Rectal Carcinoma by him appeared in THE LANCET of Nov. 23rd, 1907. Another paper, on Congenital Piles, appeared in THE LANCET of June 1st, 1907. His last paper upon a case of death under spinal anæsthesia, as late as March 26th, is an evidence of his conscientious desire to fairly give to others the benefit of his own practice.

Mr. Milward was a man of upright, manly, and straightforward character. The keynote of his life was thoroughness; to whatever he put his hand, whether it was work or play, he gave his best. Careful and painstaking in the performance of his duties, his accurate knowledge and large surgical experience gave strength and value to his opinions. Naturally of a retiring disposition, "showiness" in method or manner was not deemed worthy of cultivation, but no service was accounted too heavy when the welfare of his patients had to be considered, and his loyalty to them and to his friends was unbounded. His amiable disposition, generous bearing, and many fine qualities of mind united to him a large circle of friends, who now mourn his premature decease. To the local medical societies he made many contributions, and at the time of his death he was surgical secretary to the Midland Medical Society. Besides his strictly professional work, Mr. Milward interested himself and did much strenuous spade-work as honorary secretary to the Birmingham Branch of the Red Cross Society, and to his efforts the present flourishing condition of this particular city branch, as distinguished from the county branch, is due. In the Territorial Army he ranked as captain, *à la suite*, in connexion with the 1st Southern General Hospital, Territorial Force. He was looked upon as one of the most promising and skilful operators whose high ideals and unselfish character exemplified the best traditions of the medical profession. Mr. Milward married the daughter of Mr. B. Tilley of Edgbaston; he leaves a widow and one child. The funeral at Harborne Church on April 4th was conducted by the Archdeacon of Birmingham and the Rev. Canon Moss, and was attended by a large number of his colleagues and friends and representatives of various public institutions, whose presence testified to the high regard in which he was held during a short life affording a bright prospect of success.

DEATHS OF EMINENT FOREIGN MEDICAL MEN.—The deaths of the following eminent foreign medical men are announced:—Dr. C. Botez, professor of external pathology in the University of Jassy.—Dr. Hennequin, member of the Paris Surgical Society.—Dr. Grébant, professor of general physiology in the Museum of Natural History and member of the Paris Academy of Medicine.—Dr. Wilhelm Camerer, whose researches on the pathology of metabolism and other problems of physiological chemistry brought his name prominently before the medical public some years ago. The University of Tübingen conferred an honorary doctorate upon him in 1895 in recognition of his physiologico-chemical researches. His age at his death was 67 years.

AN EXHIBITION OF FRACTURES.—The *Société Internationale de Chirurgie* has just issued a circular with reference to an "Exposition de Fractures," to be held at Brussels in September, 1911, on the occasion of the third congress of the society. Dr. J. Lucas-Championnière is the president of this congress, M. A. Depage is the secretary-general, and M. L. Mayer is the secretary. Everything relating to the study of fractures will be exhibited, particularly various types of rare fractures; radiograms, drawings, plaster-casts, and moulds of the same; apparatus for the bloodless treatment, the rigid treatment, and the ambulatory treatment; extension apparatus; exhibits and documents relating to osteo-synthesis, and so on. The objects intended for exhibition should reach the secretary-general at 75, Avenue Louise, Brussels, from Aug. 20th to 31st, 1911, who will arrange for their receipt, installation, and return on the expiration of the congress. Exhibitors will be able to make demonstrations of their apparatus during the congress, and subjects will be placed at the disposal of exhibitors who require them. Special railway rates, it is hoped, will be obtained, as they were for the Cancer Exhibition in 1908. Further information and forms to fill up for those who intend to enter objects will be supplied by the secretary-general on demand.

Medical News.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At the First Professional Examination, held on March 29th, 30th, and 31st, and April 1st and 2nd, the following gentlemen were approved in the undermentioned subjects:—

Biology.—Wilfred Herbert Alderton, London Hospital; William Guy Embleton Allen, St. Bartholomew's Hospital; Errington Atkinson, London Hospital; Cecil Bluett, Sydney University and London Hospital; Maurice Charles Breese, Westminster Hospital and King's College; Norman Briggs, Leeds University; Eric Catford, St. Bartholomew's Hospital; Percival Cheal, London Hospital; Hugh Forster Chillingworth, St. Bartholomew's Hospital; George Edwin Chissell, Middlesex Hospital; Edmund Sheppard Cuthbert, St. Bartholomew's Hospital; Gordon Robert Craig, Middlesex Hospital; Jean Crétin, St. Bartholomew's Hospital; George Stanley Deane, Robert Edmund Barry Denny, and James Angel Durante, London Hospital; Stanley Ernest York Elliott, St. Mary's Hospital; David Trevor Evans, University College, Cardiff; Sidney William Fisk, University College; Luis Hernando Garces, London Hospital; Cassidy de Wet Gibb, Guy's Hospital; Ernest Richard Gordon Greville, St. Thomas's Hospital; Henry Judson Grimshaw, Liverpool University; Douglas Noel Hardcastle, Technical College, Brighton; Arthur Herbert Harkness, Guy's Hospital; William Llewellyn Aplin Harrison, St. Mary's Hospital; Newton Hoffmeister, Middlesex Hospital; Richard Annesley Holmes, Guy's Hospital; Ifan Septimus James, University College; Edward Glyn Jones, Liverpool University; Gerald Patrick Kidd, St. Thomas's Hospital; Thomas Clatworthy Kidner, Middlesex Hospital; Holger August Hugo Kleberg, St. George's Hospital and King's College; Felix Edward Ricardo Laborda, Guy's Hospital; Annesley George Lennon-Brown, Westminster Hospital and King's College; James Stuart Leslie, James Arthur Liley, and Neville Hood Linzee, London Hospital; Louisa Margaret Lister, Bristol University; Henry Guy Ludolf, Leeds University; Henry Wingate Maltby, St. Bartholomew's Hospital; Gerald Struan Marshall, Charing Cross Hospital; Gerald Woffindin Maw, Birkbeck College; Alan Lawrence Miller, Birmingham University; Donald Samuel Eccles Milligan, St. Thomas's Hospital; George Stanley Mitchell, Westminster Hospital and King's College; Herbert Guy Moser, St. Bartholomew's Hospital; Wilfred Guy Stuart Neely, Guy's Hospital; Walter Justice Paramore, University College; John Meredydd Parry, University College, Cardiff; Ernest Noble Perham, University College; Haydn Peters, Charing Cross Hospital; Arthur Bennet Preston, London Hospital; Roberto Quesada-Jimenez, Costa Rica University and Guy's Hospital; William Ewart Patrick Rafter, Liverpool University; John Wootton Rammell and Charles Reginald Reckitt, London Hospital; Laurence Cecil Sebastian Roche, St. Thomas's Hospital; George Francis Roweroft, St. Bartholomew's Hospital; Noel Humphrey Wykeham Saw, Guy's Hospital; Herbert Henry Silley and Sydney Frank Simpson, King's College; Peter de Saffarie Smith, University College, Bristol; Cecil Spurling Staddon, St. Thomas's Hospital; Robert Cyril Wilmer Staley, Guy's Hospital; John Aylmer Tippet, St. Thomas's Hospital; Myles Denison Boswell Tonks, London Hospital; Ambrose Huntington Warde, St. Thomas's Hospital; and Norman Jeune Willans and Thomas Mansergh Wood-Robinson, Middlesex Hospital.

Chemistry and Physics.—Alexander William Charles Bennett, St. Thomas's Hospital; William McHutchison Binning, University College; Maurice Charles Breese, Westminster Hospital and King's College; Hugh Forster Chillingworth, St. Bartholomew's Hospital; George Edwin Chissell, Middlesex Hospital; William Lonsdale Cockcroft, Manchester University and Technical School, Rochdale; Stephen Walter Coffin, Guy's Hospital; Ernest Ivon Davies, University College, Cardiff; Philip Cuthbert Collingwood Fenwick, St. Thomas's Hospital; George Cowley Gell, Middlesex Hospital; Donald Herbert Hargrave, London Hospital; Oswald Ryle Horwood, M.A. Cantab., Cambridge University; Charles George Gordon Keane, St. Mary's Hospital; Felix Edward Ricardo Laborda, Guy's Hospital; Labib Abdul Malik, St. Mary's Hospital; Gerald Struan Marshall, Charing Cross Hospital; Walter Edgar Masters, London Hospital; Walter Justice Paramore, University College; Arthur Bennet Preston and John Wootton Rammell, London Hospital; Cecil Arthur Robinson, St. Mary's Hospital; Alan Filmer Rook, Guy's Hospital; Myles Denison Boswell Tonks, London Hospital; Eric Morse Townsend, Royal Technical Institute, Salford, and Chelsea Polytechnic; Norman Jeune Willans, Middlesex Hospital; and Ernest Jenner Wright, St. Mary's Hospital.

Chemistry.—Percy William Lavers Andrew, Technical College, Brighton; Edward Victor Briscoe, St. Mary's Hospital; Paulin Roger Chevreau, Guy's Hospital; David Trevor Evans, University College, Cardiff; Harold Percy Gabb, University College; Douglas Vernon Halstead, Guy's Hospital; Claude Osborne Hudson, Sheffield University; Aubrey Thompson Madin, Municipal Technical School, Birmingham; Noel Heathcote Seton Maelzar, Guy's Hospital; George Stanley Mitchell, Westminster Hospital and King's College; Edgar Stanley Rowbotham, Charing Cross Hospital; Noel Humphrey Wykeham Saw, Guy's Hospital; and William Ernest Wade, University College, Cardiff.

Physics.—Charles Theodore James Drobig, St. Mary's Hospital; Herbert Carr Duggan, Guy's Hospital; Arthur Geoffrey Pattison Hardwick, London Hospital; Harry Millett, Guy's Hospital; Arthur Rennie Muir, University College, Cardiff; Kenneth Montague Nelson, St. Mary's Hospital.

At the Second Professional Examination in Anatomy and Physiology, held on March 31st, and April 1st, 4th, and 5th, 94 candidates presented themselves, of whom 62 were approved and 32 were referred. The following are the names of the successful candidates:—

Charles Beresford Alexander, Liverpool University; Saravalya Amritaraj, L.R.C.P. & S. Edin., L.F.P.S. Glasg., Madras Medical College and Edinburgh; John Vere Orlebar Andrew, London Hospital; Gilbert Bailey, Manchester University; Stephen Leonard Baker, London Hospital; John Henry Bennett, St. George's Hospital and King's College; Alured Charles Lowther O'Shea Bilderbeck, Cambridge University and St. Bartholomew's Hospital; Kareem Black, King's College; Bertram James Brewitt and Roger Orme Bridgman, St. Bartholomew's Hospital; Alfred Fisher Camp and Rowland Burnell Campion, Guy's Hospital; Eliezer Coplans, Liverpool University; William Dale, St. George's Hospital and King's College; William Agar Scholefield Duck, Middlesex Hospital; Maurice Dwyer, Leeds University; William Trevor Flooks, University College, Cardiff; William Kelsey Fry, Guy's Hospital; Alfred Noel Garrod, Cambridge University and St. Bartholomew's Hospital; Henry Albert John Gidney, Major I.M.S., L.S.A., F.R.C.S. Edin., D.P.H. Cantab., Calcutta and Middlesex Hospital; Leslie Price Harris, Guy's Hospital; Spencer Frederick Harris, Middlesex Hospital; Theodor Julius Juta Jeppe, Cambridge University and St. Thomas's Hospital; Hugh Percival Joseph, L.M. & S. Ceylon, Ceylon Medical College; Claude Kingston, Bristol University; Herbert Arnold Lake, M.R.C.V.S., University College Hospital; George Howard Strettell Letchworth, B.A. Cantab., Cambridge University and St. Bartholomew's Hospital; John Llewellyn David Lewis, Guy's Hospital; Harold Bishop Logan, Bristol University; Farquhar McGillivray Loughnane, St. Thomas's Hospital; Henry Leslie Messenger, Guy's Hospital; Robert Hamilton Miller, M.R.C.V.S., Edinburgh University; Arthur Stanley Morgan, Guy's Hospital; Owen Colville Morphy, Middlesex Hospital; Frank Andrew Miller Nelson, London Hospital; George Marshall Oakden, Middlesex Hospital; Robert Charles Parry, London Hospital; Claud John Burgoyne Pasley, Westminster Hospital and King's College; Edward Phillips, London Hospital; D'Arcy Power, St. Bartholomew's Hospital; George Brentnall Pritchard, Guy's Hospital; Arthur Leslie Hanworth Rackham, Middlesex Hospital; William Arthur Rail, St. Bartholomew's Hospital; Stanley Owen Raskbrook, London Hospital; Rachel Ricketts, L.M.S., Calcutta, Calcutta University; Pierre Roux, London Hospital; Alexander Elder Saunderson, Liverpool University; Samuel Arnold Sittampalam, L.M.S. Ceylon, Ceylon Medical College; Jack Garland Skeet, St. Thomas's Hospital; Alan Ker Soutar, B.A. Cantab., Cambridge University; Owen William Dyne Steel, London Hospital; William Vere Taylor Styles, Middlesex Hospital; Gordon Bower Sutton, B.A. Cantab., Cambridge University and King's College; John William Thomas, Leeds University; Thomas Ainsworth Townsend, King's College; Herbert Walker, B.A. Cantab., Cambridge University and St. Thomas's Hospital; Hamlet Mark Whelan, University College, Cardiff; Syer Barrington White, B.A. Oxon., Oxford University and Westminster Hospital; William Cuthbert Whitworth, Guy's Hospital; Stanley Wickenden, Guy's Hospital; Charles Eustace Williams, Charing Cross Hospital; and Oscar Reginald Lewis Wilson, Guy's Hospital.

At the quarterly examination in Practical Pharmacy held on April 7th the following gentlemen were approved:—

William Rawson Barlow, Middlesex Hospital; James Cowan, Manchester University and private study; Charles Alexander Robertson Gatley, Guy's Hospital; Willoughby Gordon Grant, London Hospital and private study; Philip Hamill, M.A. Cantab., D.Sc. Lond., Cambridge University and St. Bartholomew's Hospital; Arthur Herbert Harkness, Guy's Hospital; Augustus Joseph Hickey, Westminster Hospital; Sydney James Higgins, B.A. Cantab., Cambridge University and London Hospital; Ivor Robert Hudleston, St. Bartholomew's Hospital; Cyril William Jenner, London Hospital and private study; George Basil Henley Jones, Guy's Hospital; William Henry Talfourd Jones, Guy's Hospital and private study; George Arthur Edward Kelman, King's College and Westminster Hospital, Harold Drew Lander, Cambridge University and St. Bartholomew's Hospital; Lewis Francis Gurslave Lewis, B.A. Cantab., Cambridge University and St. Bartholomew's Hospital; Charles Erie Lowe, Westminster Hospital; Victor Alfred Lunn, Guy's Hospital; Avenel Frederick Cleeve Martyn, St. Mary's Hospital; Marwood Mintern Munden and Wilfred Guy Stuart Neely, Guy's Hospital; Richard James Paget, Middlesex Hospital; Charles Edward Hewitt Paley, Westminster Hospital; Hubert Charles George Pedler, University College Hospital; Montague Pern, Guy's Hospital; Oswald Pitt, Manchester University; Alfred Henry Richardson, M.A. Cantab., Cambridge University and St. Thomas's Hospital; George Holmes Smith, L.D.S. Eng., St. Mary's Hospital; Patrick Arthur Sullivan, Birmingham University; Frederic Charles Victor Thompson, Guy's Hospital; Daniel Owen Twining, University College Hospital; Richard Herbert Vercoe, B.A. Cantab., Cambridge University and University College Hospital; Ronald Herbert Vicary, St. Mary's Hospital; and George Ernest Vilvandré, Claude Bedford Welsby, and Hugh Wetherbee, London Hospital.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At the Preliminary Science Examination for the Licence in Dental Surgery held this month the following gentlemen were approved in the undermentioned subjects:—

Chemistry and Physics.—Walter Frederic Edgar Badcock, High School, Middlesbrough; Horace Edgar Bampton and Robert Leslie Booth, Birmingham University; William Allen Bulleid, Guy's Hospital; Walter Tyrrell Cooper, University College, Cardiff; Cyril Lister Curle, Birmingham University; Harry Drake, Leeds University; Will Smith Harris, Technical College, Bradford; Sydney Nuttall Hayes, Technical School, Manchester; Llewelyn Gwynne Hopkins, University College, Cardiff; Arthur James Horniblow, University College, Reading; Bertrand Kemp Jackson, High School, Middlesbrough, and Harris Institute, Preston; William Sanders Johnstone, Charing Cross Hospital; Ewart McArd, Middlesex Hospital; Frederic Humble Morrell, High School, Middlesbrough; Raphael

Neft, Darmstadt University; Winifred Amelia Oaten, London School of Medicine for Women; Gustavus Leigh Pemberton, Battersea Polytechnic; Thomas William Stark, University College, Nottingham; Donald Thorne, University College, Exeter; Thomas Bernice Tustian and Percy James Wakley, University College, Cardiff; and Frank Roland Wallis and Frank Wisher, Guy's Hospital.

Chemistry.—Percy Ashton, Birmingham University; Alan Strafford Clarke, M.A. Cantab., Birkbeck College; Herbert Howard Cooke, Cardiff and Technical Institute, Wandsworth; Thomas Clement Davies, Charing Cross Hospital; Percy Scott McFarlane, Birkbeck College; Charles Wyndham Martin, Liverpool University; Benjamin Micklethwait, Birkbeck College; Arthur Pomroy Sainsbury, Polytechnic Institute; and Edward Royston Saul, Guy's Hospital.

Physics.—William Francis Gawne, Technical School, Liverpool; William John O'Kane, Guy's Hospital; Robert William Spong, Municipal College, Portsmouth; John Alphonsus Tighe, Technical Institute, Wandsworth; Samuel Lloyd Wallis, Birkbeck College; and Lewis William Wilson, Charing Cross Hospital and Technical Institute, Wandsworth.

UNIVERSITY OF LONDON.—At the Second Examination for Medical Degrees, Part I., the following candidates were successful:—

Organic and Applied Chemistry.—W. P. Charles Abeyedeera, University College; Elizabeth Labrey Ashby, University and Municipal Technical School, Birmingham; Guido Carlo Giulio Baldini, St. Bartholomew's Hospital; Frank Montague Barnes, St. Thomas's Hospital; William Claude P. Barrett, University College; Irene Bastow, London (Royal Free Hospital) School of Medicine for Women; Frederic Vivian Bevan-Brown, Guy's Hospital; Marjorie Ada Blandy, London (Royal Free Hospital) School of Medicine for Women; John Bostock, London Hospital; Alice Dorothea Brooks, London (Royal Free Hospital) School of Medicine for Women; Frederick Charles S. Broome, Guy's Hospital; William Burt and Harold Garrett Chaplin, St. Thomas's Hospital; Raymond John Clausen, University College; Aaron Simeon Cohen, University College, Cardiff; Dora Challis Colebrook, London (Royal Free Hospital) School of Medicine for Women; Frank Collar, Guy's Hospital; John Kenyon Davies and Percy Vernon Davies, University College, Cardiff; William Llewellyn G. Davies, Guy's Hospital; William Thomas Davies, London Hospital, University Tutorial College, and private study; Frederick Henry Dodd, Guy's Hospital; Arthur Rawdon C. Doorly, St. Thomas's Hospital; Cyril Henry Edwards, Birkbeck College and private study; Ahmed Fahmi El-Hakim, London Hospital; Pattie Ruth Elliott, London (Royal Free Hospital) School of Medicine for Women; Robert Ellis, University and Municipal Technical School, Birmingham; Philip Oswald Ellison, St. Bartholomew's Hospital; Henry William Evans, Guy's Hospital; Julian Trevor Eyre Evans, St. Mary's Hospital; Hugh James Orr Ewing, University of Bristol; George Finch, University College; Septimus Alexander Forbes, London Hospital; Humphrey Leonard George Foxell, University College; Charles Hamilton Gould,* Guy's Hospital; Frank Arthur Grange, London Hospital; Malcolm Gross, King's College and Westminster Hospital; Charles Frederick Hacker,* King's College; Allen Coulter Hancock, Guy's Hospital; Mary Esther Harding, London (Royal Free Hospital) School of Medicine for Women; Daniel Thomas Harris, private study; John Richard Harris and Claude Charles Harrison, University of Bristol; Stanley Sextus B. Harrison,* Guy's Hospital; Henry Julyan Hoyte, King's College; Charles Evans Jenkins, University College, Cardiff; Rosalie Jobson, London (Royal Free Hospital) School of Medicine for Women; Stanley Burrough King, St. Mary's Hospital; Leslie Mordaunt Ladell, London Hospital; Kingsley Wassell Lewis, University College, Cardiff; Iorwerth H. Lloyd-Williams, University Tutorial College; Norman Peace Lacy Lumb, St. Thomas's Hospital; Ronald Guy Lyster, St. Bartholomew's Hospital; Fede Margherita Mackenzie,* London (Royal Free Hospital) School of Medicine for Women; Desmond Manus MacManus, Guy's Hospital; Edith Marjorie Martland, London (Royal Free Hospital) School of Medicine for Women; Jivraj Narayan Mehta, Grant Medical College, Bombay, and London Hospital; Allan Noel Minns and James York Moore, Guy's Hospital; Henry Ray Parsloe, London Hospital; Purushottam Tulsibhai Patel, Grant Medical College, Bombay, and London Hospital; Julian Lionel Priston, London Hospital; James Albert Robinson and William Eric Roper Saunders, St. Bartholomew's Hospital; Gerald Davenant Shann, King's College; Henry Richard Sheppard, Brighton Municipal Technical College; Ronald Silcock, St. Mary's Hospital; Reginald Hugh Simpson, St. Bartholomew's Hospital; John Smith Sloper, St. Thomas's Hospital; Leslie Muir Smith, Guy's Hospital; Francis Gerald Augustus Smyth, St. Bartholomew's Hospital; Trevor Richard Snelling, London Hospital; Edward Sequier Sowerby, University of Bristol; Clifford William Sparks, St. Thomas's Hospital; John Eric Stacey, University of Sheffield; Grace Stapleton, London (Royal Free Hospital) School of Medicine for Women; John Stephenson, Guy's Hospital; William Edmund Taylor, University of Bristol; Naomi Tribe, London (Royal Free Hospital) School of Medicine for Women; Ernest Haines Walker, St. Thomas's Hospital; Herald Joseph Wallace and John Glen Wardrop, University College; George Nesbit Welsford, University of Bristol; Gerald Richard Courtenay Wilson, St. Thomas's Hospital; Arthur Graham Winter and Herbert Gregory Winter, London Hospital; and Douglas H. David Wooderson, St. Bartholomew's Hospital.

* Awarded a mark of distinction.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates passed in the subjects indicated:—

PRIMARY EXAMINATION, PART I.

Biology.—R. W. L. Oke, London Hospital.

Chemistry.—A. U. L. Bennet, Royal Free Hospital.

Materia Medica and Pharmacy.—H. H. Gunnell, Guy's Hospital; A. R. Jennings, Cambridge; L. E. Lewis, Cardiff; and O. Marshall, University College Hospital.

PART II.

Anatomy.—R. B. F. Frazer, Charing Cross Hospital; A. Griffith-Williams, Cambridge and London Hospital; K. L. Hart-Davis, Royal Free Hospital; and D. Havard, L. M. Ladell, and G. A. Walker, London Hospital.

Physiology.—F. S. Charnock, Manchester; P. R. Cross, St. Mary's Hospital; G. E. Cuttle, Manchester; R. B. F. Frazer, Charing Cross Hospital; A. Griffith-Williams, Cambridge and London Hospital; K. L. Hart-Davis, Royal Free Hospital; and D. Havard, L. M. Ladell, and G. A. Walker, London Hospital.

LONDON SCHOOL OF TROPICAL MEDICINE.—The following students have successfully passed the examination held at the end of the thirty-second session, January to April:—

T. B. Adam (Colonial Service), R. Blue (United States Public Health and Marine Hospital Service), *G. D. H. Carpenter (Colonial Service), E. A. S. Carrington, *P. Harper (Colonial Service), W. Kelly, C. G. Kurien, *J. C. McPherson (Colonial Service), *W. Morrison (Colonial Service), A. Onsy, E. D. Shroff, B. R. Vickers, and G. Wilson (Colonial Service).

* Passed with distinction.

FOREIGN UNIVERSITY INTELLIGENCE.—*Berlin:* Professor Waldeyer, the Director of the University Anatomical Institute, who is 73 years of age, intends to retire at the close of the ensuing summer session. The title of Professor has been conferred upon Dr. Johannes Herzog, *privat-docent* of Ophthalmology, and also on Dr. Gonzer, General Secretary of the Temperance Society.—*Bonn:* The charge of the Physiological Institute, vacant by the death of Professor Pflüger, has been taken over temporarily during the vacancy by his first assistant, Professor Schöndorff.—*Heidelberg:* Dr. J. Hoffmann, Extraordinary Professor of Medicine, has been appointed Honorary Ordinary Professor.—*Prague (German University):* Dr. Julius Rihl has been recognised as *privat-docent* of General and Experimental Pathology.—*Vienna:* Dr. Otto Kahler has been recognised as *privat-docent* of Otology and Rhinology.

THE ROYAL SANITARY INSTITUTE.—A provincial sessional meeting of the Royal Sanitary Institute will be held at Leicester on April 22nd and 23rd. On the first-named date, at 7 P.M., in the council chamber of the town-hall, Mr. E. G. Mawbey, M.Inst.C.E., will open a discussion on "Purification of Leicester Sewage, &c.," Mr. H. D. Searles-Wood being in the chair. Among those who are announced to take part in the discussion are Dr. A. Bostock Hill and Dr. George Reid. On April 23rd visits will be made to the Abbey Sewage Pumping Station and to the new bacterial works and broad irrigation at the Beaumont Leys Farm. Further particulars of the meeting may be obtained from Mr. Mawbey, the borough engineer and surveyor of Leicester, and from Mr. E. White Wallis, secretary of the Royal Sanitary Institute, 90, Buckingham Palace-road, London, S.W.

THE WINSLEY SANATORIUM NEAR BATH.—This institution, which was founded in 1904 by the Three Counties Branch of the National Association for the Prevention of Consumption for the poorer consumptives of Gloucester, Somerset, and Wilts, has just issued its annual report for the year 1909. The number of beds available in the sanatorium during the year was 68, 43 of which are maintained and 9 leased to various authorities. Of the remaining 16, 12 are reserved for patients at a payment of 15*s.* per week and 4 are utilised by the management for patients who pay 35*s.* to 42*s.* per week. The report of the medical officer, Dr. Leonard Crossley, shows that 248 patients were admitted during the year under notice and 236 discharged. Of these 111 left fit for work, 82 left improved, 37 left not improved, and 6 died in the sanatorium. An urgent appeal is issued by the board of management for increased support towards the reduction of the capital debt, which stands at over £9000.

THE ROYAL HOSPITAL FOR SICK CHILDREN, GLASGOW.—The annual report of the directors of the Royal Hospital for Sick Children, Glasgow, clearly shows the urgent needs, to meet which the board is appealing for funds. Some £94,000 have already been subscribed, but there is still a balance of £26,000 to be made up. During the year 1909 1012 patients were treated. Of these cases 493 were medical and 519 surgical. Of the total cases admitted 146 were infants under one year of age, and 150 were over one year and under two years of age. The average daily number under treatment in the hospital was

70. At the country branch of the institution, Drunchapel, 87 patients were treated. The ordinary income of the hospital was £7387 12*s.* 3*d.*, and the expenditure £7627 14*s.* 2*d.*, leaving a deficiency of £240 1*s.* 11*d.*

A CHURCH LADS' BRIGADE MEDICAL CORPS.—The formation of a medical corps in connexion with the Church Lads' Brigade is an important innovation. A corps of this kind has just been established at Brighton, with Surgeon-Major H. G. Hilbers as commanding officer. The lads are thoroughly interested in the work. Recently at field practice they showed three distinct kinds of work—first-aid treatment to lines of casualties, transit of wounded, and arrival at the collecting station. Demonstrations were also given in lifting unconscious patients by the fireman's lift, of artificial respiration, and of treatment for shock.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Deaths from Privation in 1908.

THE return has been published "of the number of deaths in England and Wales in the year 1908 upon which a coroner's jury has returned a verdict of death from starvation or death accelerated by privation, together with any observations furnished to the Local Government Board by boards of guardians with reference to cases included in the return.' The return includes 125 deaths, of which 52 occurred in the administrative county of London and 73 in the provinces. In two cases the jury returned a verdict that the death was due solely to "starvation." In 11 cases death was ascribed to starvation in conjunction with some other cause—e.g., disease, drink, exposure, or self-neglect. For the most part the deaths appear to have been due to disease consequent upon or accelerated by want or exposure, or both, or to self-neglect. In several cases death was due to causes unconnected with destitution. In 80 of the 125 cases no application had been made for poor relief or application was only made when the deceased was in a dying condition.

Poor-law Reform.

The debate in the House of Commons on the Prevention of Destitution Bill on Friday, April 8th, resolved itself into a discussion on Poor-law reform. The Bill embodies the recommendations of the Minority Report of the Royal Commission on the Poor-laws and was brought forward by Sir R. PRICE with the object of instituting a debate on these questions rather than as an attempt at immediate legislation. What was notable about the occasion was the earnestness and the non-party character of the speeches. Particular attention was given to the tone of Mr. BALFOUR'S speech, in which he emphasised the points of agreement rather than the points of difference which emerged in the course of the Royal Commission's inquiry. He urged also on Members on both sides the expediency of not allowing themselves to be dragged into controversy as between the two reports. Mr. ASQUITH entered fully into the spirit of the remarks of the Leader of the Opposition. In the present state of politics there is little chance of the Government introducing legislation in the immediate future to deal with the problems presented in the reports of the Royal Commission. The Prime Minister's concluding sentence, however, embodies the intentions of the present Government. "So far as I know the temper of the House of Commons," he said, "the moment we are able to address ourselves with free hands and full opportunity to the solution of the urgent problems which remain unsolved, I believe we shall carry with us, not the support of this party or of that, but the practically unanimous support and sympathy of the nation as a whole."

The Protection of Water-Supplies.

A joint committee of both Houses of Parliament is being appointed to consider the protection of water-supplies.

Sewage Disposal.

An appendix containing memoranda on special investigations and experiments has just been published to the fifth report of the Royal Commission on Sewage Disposal.

Milk-Supply.

Disappointment is expressed in many directions in the House of Commons that no general legislation dealing with milk-supplies is to be brought forward by the Government this session. Mr. BURNS is not inclined to re-introduce his Milk Bill of last year. His reason is that in the present state of political controversy it would be quite impossible to make progress with it. That is equally true of other departmental Bills. At the same time it is quite evident from the trend of the debate on the milk-supply clauses of the London County Council (General Powers) Bill that a very large section of the House of Commons views with disfavour the granting of fresh powers to individual local authorities in lieu of general legislation. This section, which protested against what is called "piecemeal legislation," was numerous enough to secure the deletion of the milk clauses which the London County Council desired. However, it was noticeable that many who voted against those clauses spoke in favour of general legislation on the subject. Some private Members intend, if they can obtain an opportunity, to urge further considerations on the Government to reintroduce the Milk Bill. Mr. COURTHOPE did in fact on Wednesday, April 13th, bring in a Bill "to make better provision with respect to the sale of milk and the regulation of dairies." It was read a first time. It is understood that its terms in some respects approximate to those of Mr. BURNS'S Bill of last year.

HOUSE OF COMMONS.

WEDNESDAY, APRIL 6TH.

The Dairies, Cowsheds, and Milkshops Order (Ireland).

Mr. KERR-SMILEY asked the Chief Secretary to the Lord Lieutenant of Ireland whether he would state what was the total annual cost of administering the Dairies, Cowsheds, and Milkshops Order in the county of Antrim, and was any part of this expenditure paid out of the Imperial Exchequer.—Mr. BIRRELL replied: I am informed by the Local Government Board that the cost of administering the Order in county Antrim amounts, so far as fixed salaries of inspecting and registering officers are concerned, to £701 per annum. This does not include the remuneration of a few inspecting officers, who are paid by fees or incidental expenses. Half the salary of each veterinary inspector might be recouped from the Local Taxation account, provided there was an available margin, having regard to the limitation imposed by Section 6 of the Local Government (Ireland) Act, 1902. This restriction, however, is operative in all the sanitary districts in the county except Ballycastle rural district and Carrickfergus urban district, where there are credit balances of a trifling amount.

THURSDAY, APRIL 7TH.

Milk Legislation.

Mr. CHARLES BATHURST asked the President of the Local Government Board whether, in order to check the continued promotion by some urban local authorities of piecemeal legislation affecting the production and distribution of milk, he would introduce in the course of this session a Bill of universal application which would secure uniformity of administration on the part of all such authorities.—Mr. BURNS wrote in reply: I am afraid that in the present circumstances I cannot contemplate a general Bill on the subject of milk.

The Royal Commission on Tuberculosis.

Mr. CHARLES BATHURST asked the President of the Local Government Board whether the Royal Commission on Human and Animal Tuberculosis, which was appointed on August 31st, 1901, was still pursuing its investigations in reference to the communicability of bovine tuberculosis to human beings, and, if so, whether, in view of the urgent importance of the questions referred to the Commission, especially in their bearing upon the production and distribution of milk and of the fact that no report of the Commission had been issued since the third interim report of January, 1909, he would urge the Commission to present a fourth interim or a final report with as little delay as possible.—Mr. BURNS (in a written answer) replied: I understand that it is not the intention of the Commission to issue any further interim report, but the members are now engaged in considering the results of the experimental investigations and drafting the final report, and it is hoped that they may be able to present this in the course of a few months.

The Notification of Births Act in Scotland.

Mr. VIVIAN asked the Lord Advocate whether he would state how many local authorities had adopted the Notification of Births Act in Scotland, the names of such local authorities, and what diminution in the infant death-rate under one year had taken place.—Mr. URE replied (by written answer): I am informed that 23 local authorities in Scotland have already adopted the Act referred to, while four have resolved to do so this year. The infantile mortality rate depends so much upon the yearly weather conditions and the incidence of epidemic disease that it is not as yet considered safe to base upon its variations any inference as to the effect of the Notification of Births Act. The names of the local authorities are as follows, the four in which the Act is to become operative this year being marked with an asterisk. Burghs: Edinburgh, Glasgow, Stirling, Paisley, Greenock, Partick, Renfrew, Leith, Falkirk, Kilmarnock, Dundee, Govan, Kirkcaldy, Musselburgh, Irvine, Hamilton, Motherwell, Port Glasgow, Aberdeen, Pollokshaws, *Inverness, and *Ayr. County districts: Kirkcaldy district of Fife, Lower Ward district of Lanark, Upper district of Renfrew, *Middle Ward district of Lanark, and *Dunfermline district of Fife.

The Milk-supply in London.

The London County Council (General Powers) Bill was on the notice paper for second reading. Part VI. contained provisions for dealing with the milk-supply.

On the motion for the second reading of the Bill,

Mr. COURTHOPE moved its rejection as an amendment. He said that this was the third year in succession in which he had had to oppose a Bill of the London County Council on behalf of the agricultural bodies of the country. The ground of his opposition was based on the attempt to continue an obnoxious and admittedly defective system of piecemeal legislation with regard to milk-supply. He was fully aware that the agricultural opposition was only directed to Part VI. of the Bill, and he was perfectly willing, if the representatives of the London County Council would indicate their willingness to accept a subsequent motion of his to instruct the Select Committee to delete Part VI., to withdraw his opposition to the Bill. He admitted that milk legislation was necessary, but his objection was to the piecemeal proposals of the Bill. He would point out two or three defects in the milk-supply clauses of the Bill. In Clause 33, for instance, the London County Council took powers to take samples of milk *in transitu* at any time practically till it reached either the place where it was retailed or the place where it was supplied for human consumption. Up to that moment the London County Council proposed to place the whole responsibility for

any contamination in handling in transit on the dairy farmer or producer. There were many cases which could be cited in which the dairy farmer had transmitted the milk to London and it had been adulterated after it had left his hands, and so long as that policy was adopted, so long would the sense of injustice remain in the minds of the dairy farmers, and strenuous opposition would be offered to proposals of that kind. Then came other clauses to which he and his friends objected. They were Clauses 37 and 42, under which the Council sought to take extraordinary powers outside its jurisdiction for its inspectors, medical officers, and veterinary officials which gave rise to great inconvenience without being effective for the purpose of protecting the consumer. These clauses were not the only provision which London had for the protection of its milk-supply. It had already got in one of its Acts what were known as the model milk clauses, which were, so long as this piecemeal legislation went on, the only possible basis of agreement and convenient legislation which one could devise, although he admitted that they were imperfect. The only other point of importance contained in these new clauses was with reference to tuberculosis. There were provisions which were based on the third interim report of the Tuberculosis Commission. They were to include powers to deal with tuberculosis and with emaciation, as the Bill stated, and also with cows which gave tuberculous milk, in addition to the powers already possessed to deal with tuberculosis of the udder. He had no particular fault to find with the proposals made with these two additions as far as they went, but the chief ground of objection was the objection upon principle to piecemeal legislation. He asked the President of the Local Government Board to bear in mind that by the Bill of the London County Council hardship would be inflicted on the poorer communities by unloading on them milk which London would not accept. He expressed an opinion that the Milk Bill as introduced by the Government last year could easily have been passed during the evenings which were wasted before Easter.

Mr. STANIER seconded the amendment.

Mr. WALTER GUINNESS, who spoke on behalf of the London County Council, said that that body would have preferred general legislation. The Milk Bill introduced last year would have done all that was required. He fully recognised that the effect of the milk-supply clauses in the London County Council Bill would, whilst keeping milk of an inferior quality out of London, not prevent it being sold in other localities. That undoubtedly was an evil, but London was specially in need of legislation because a very large proportion of its milk-supply came from a considerable distance, and polluted milk was far less injurious if drunk fresh before the bacilli had time to breed than if drunk even 24 hours or two days later, when the microbes had had time to propagate. For that reason London had a right to be considered perhaps before any other part of the country. He went on to point out that in 1907 a penalty was placed in London on the sale of tubercular milk of cows with tuberculous udder. In the two years in which that provision had been in force a considerable improvement had taken place and farmers had taken care not to sell milk from cows with a tuberculous udder. Since then information had come to light showing that the tuberculous udder was not the only form of disease from which infection might take place The third interim report of the Royal Commission on Tuberculosis showed that any form of tuberculosis in cattle was liable to infect milk. London, he went on to say, had been the dumping ground of all the dirty milk in the country. Where a large town was in the centre of an agricultural district the agriculturist whose cowsheds were not in good order did not attempt to send his milk to that town. He sent it all to London. That was what the London County Council wished to stop. No doubt a certain amount of dirt was added locally, and powers were taken in the Bill to enable borough councils to prosecute in those cases. The dirt which was added locally on the farm could very well be distinguished from the dirt which came in on the railway. If it was found from a microscopical examination that there were farm products in the milk, it was not to be imagined that they came from the railway. If smuts or tea-leaves were found in the milk, as it was said owing to the railway porters dipping their tea-tins in the milk, no one could accuse the farmers of being responsible. It would be quite obviously railway dirt added in transit. The London County Council proposed under the Bill to take samples of milk at the railway stations and where they found gross and unnecessary negligence to inspect the farms. It was said that this was a very dangerous provision which would lead to a great deal of inconvenience on the farm, but this power was possessed at present for tuberculosis, and the London County Council could have any farm inspected where it was found that milk with tuberculosis bacilli was sent to London. The clause of the Bill only copied the provision which was actually embodied in the Milk Bill of last year. The Council was perfectly ready to withdraw its milk-supply clauses if an assurance was given that the Government really intended to pass a general Milk Bill into law.

Mr. EMMOTT, Chairman of Ways and Means, asked the House to pass the second reading and to take the division with regard to the milk-supply on the motion that it should be an instruction to the Select Committee to delete from the Bill the clauses relating to this subject.

Mr. COURTHOPE assented to this course.

The Bill was read a second time without a division.

Mr. COURTHOPE then moved "that it be an instruction to the Committee to delete Part VI. (Milk-supply)."

Mr. JAMES MASON expressed sympathy with the general objects of Part VI., but urged that anything in the shape of piecemeal legislation might materially tend to injure the interests of the consumer of milk. He was convinced that tuberculosis could be eventually stamped out, and pure milk could be got if people were willing to pay a higher price.

Mr. BURNS (President of the Local Government Board) said that the honourable Member for Bury St. Edmunds (Mr. Guinness), in his opinion, had convinced the House that legislation was necessary to enable London to deal not only with the purity of the milk-supply but to deal with tuberculous milk, whether it was drawn from cows with tuberculous udders or cows suffering from tuberculous emaciation. In fact, no one had challenged the case made out for the County Council by the honourable Member as to the necessity for legislation. The honourable Member who had just spoken (Mr. Mason) had drawn from his own experience conclusive proof that given certain conditions tuberculosis could be stamped out not only in animals but in human beings. That was a question to which, to the credit of the nation, increasing attention was being devoted. He ventured to say that tuberculosis in this country among human beings would in time be almost as scarce as typhus and typhoid now were. The disagreement between the honourable Member for Rye (Mr. Courthope) and himself arose over other points and they were very small in number. The honourable Member, ardent champion as he was of the agricultural interest, admitted that it was disadvantageous to the farming interest as a whole that it should be connected too closely with the defence of those conditions which prevented London, which was the best milk-consuming customer of the dairying trade, getting better and cleaner milk. In his opinion London ought to have twice the amount of milk it now had. The honourable Member for Rye said that he regarded it as a serious condition of things that the London County Council should have power to take samples of milk in transit. He did not regard it at all as outrageous. He would give the honourable Member a simple fact. A very ingenious statistical friend of his had calculated that the total milk-supply that came into London for a whole year was equal under normal conditions to the daily flow of the River Thames over Teddington Weir. That gave an indication of the amount of milk brought into London. Surely, therefore, if that was the extent of the trade problem with which they had to deal there ought to be no objection to a medical officer of health being empowered to take steps to see that the people who were to consume the milk should not run risks in the way of infection, and that he should be allowed to go to the other side of Teddington Weir and take a few samples in order to ascertain whether it came from cows with tuberculous udders or from cows suffering from tuberculous emaciation. In this matter they had precedent to guide them. Cities like Manchester and Leeds had not only the advantage of the model clauses, but they had the advantage of special local Acts, giving them the powers which the London County Council was now seeking. The effect was that farmers knowing that these powers existed in these cities and elsewhere no longer sent in either impure or tuberculous milk. Their cowhouses were so constructed and arranged as to give the most beneficial results to the consumers and the farmers as a whole. The honourable Member for Rye asked whether the farmer was to be saddled with responsibility for dirt added in course of transit. He would like to point out to the honourable Member that he only wished to put the farmer right in this matter. Might he say personally and as a Cabinet Minister that this was a very serious matter? In some respects it was a delicate question. It was one in which very often the farmer ought to have the benefit of the doubt because he was placed in a more difficult situation in reaching his customer than was the man who sold potatoes or turnips or meat, that were not so liable to infection of all kinds as was milk, which, while it was one of the most nutritious of foods, especially for children, was, oddly enough, the most susceptible of all forms of contagion. All Ministers and all local authorities were willing to look at the farmer from that point of view. The only other point which the honourable Member made was this. He said that this matter ought not to be treated in a piecemeal way. Ideally and theoretically, all would agree with him. If it were in France or in Germany, and in other countries where things were logically done, the question might be treated in a comprehensive fashion, but in this country things were done by instalments and compromise. Why did the honourable gentleman object to the process of instalment and compromise in legislation on an important subject like this? The honourable Member knew full well that everything which he (Mr. Burns) could do a year ago to bring in a large Milk Bill he did, and the farmers were kind enough to say that they were pleased with the attitude of the Local Government Board in regard to their trade and industry. He believed that any assurance which he could now give in regard to further action in reference to this industry would be readily received, but the honourable Member for Rye knew very well that a Milk Bill could not be got through last year because other questions took up time which he (Mr. Burns) hoped might have been partially given to a Milk Bill. The honourable Member also knew full well that if this was true of last session, it was equally true of this session. The fact was that the House on both sides was extremely anxious that the Government should keep to the main issues of this session. To suggest to the House that such a Bill could be got through this year was to whisper a promise to the ear only and to break it to the hope. He would not do that, even though it might be pleasant to the honourable Member for Rye. When the honourable Member suggested to the House that the differences on the Milk Bill were very small, he would point out to him that though this appeared to be small it was really a difficult matter to settle. There were questions relating to land and agriculture, and there was the question of whether compensation for slaughtered animals should come out of the local rates or the Imperial taxes. The honourable gentleman knew very well that this was a most thorny and contentious subject. There was this and many other aspects in connexion with the land and agricultural problem which entered into this discussion, and it was no good to try and persuade the House that the matter was not contentious or that agreement could be reached upon it in a few minutes. He was positively convinced that could not be done. But on the point which divided the various parties there was no reason for this subject being mentioned at all. Compensation for the slaughter of animals did not come into the London County Council Bill, and therefore the difference which divided them on a general Milk Bill did not come up for consideration now. The honourable Member for Bury St. Edmunds had told them the history of this subject and how London had waited not only for ten years but for longer than ten years. He had told them that model clauses were enjoyed in the provinces before London had an opportunity of receiving them, but he also told them that apart from tuberculosis in milk they had no right to allow dirty milk to come into London as it now did. That, however, was provided for in a simple way. Borough councils had power to deal with dirty milk and they would do it, he was sure, reasonably and fairly, while the London County Council would have power within the County of London to deal with tuberculous milk on evidence produced and cause shown, and also to deal with milk from cows suffering from tuberculous emaciation, besides power to deal with cows in the country outside the jurisdiction of the Council suffering from tuberculosis. Might he put this to honourable Members representing agricultural constituencies? Were they wise in the interests of the farmers and of agriculture in creating the impression throughout the country that it was to the interest of the farmer and the agriculturist that in London where dirty

and diseased milk could be sold that such a condition of things ought to be allowed to remain? The inference London people would draw from that was that the farmers must have some reason for countenancing that condition of things going on. If the confidence of people were shaken in any article of diet like milk, the tendency was that the demand and consumption of it would be diminished. It seemed to him in the best interests of the farmers that they should see to what their customers wanted—namely, that milk was not diseased and that it was produced under clean conditions. If they did so the milk trade would prosper. By the provisions in the Bill the County Council was demanding that the farmers should give better and cleaner milk to the Londoners than they did now. That would give to the farmer more profit and a larger industry. The Local Government Board and the London County Council officers would do their best to extend the industry, and would do nothing either to irritate or to prejudice the farming and dairying industry, which all of them would like to see developed more rapidly than it was now doing. It could best develop with the best sanitary conditions imposed upon it reasonably and fairly by the London County Council.

Mr. WALTER LONG criticised the action of the Government in delaying general milk legislation. The whole responsibility for inaction rested with the Government. Many who were prepared to support these clauses thought that there was much in them objectionable. It was highly objectionable that they should be passed in this special form and not in a Bill applying to the whole country. Yet honourable Members were face to face with the situation. The Government declined to attempt to carry general legislation. They said that they would, only there was more pressing work to do. Therefore, unless they supported the London County Council with this separate legislation nothing would be done until the present Government had been replaced by another for probably two or three years. Under these circumstances there could be no choice for him. He was not sure that there was not a good deal to be said against the actual procedure adopted in order to enforce this farm sanitation. Under all the circumstances, realising as he did that there was a necessity for increased inspection in this particular article of food, he for one should certainly support the Bill of the London County Council. He should do so solely because the Government were unwilling to give the House the legislation which ought to be given, and because he thought it was necessary that London at least, the greatest urban community in the country, should have that protection which many parts of the country needed.

Colonel LOCKWOOD said that he had every wish to assist the Government in ensuring that milk was sold pure, but he strongly objected to piecemeal legislation and to a series of regulations which were not uniform in their operation all over the country.

On a division there voted for the motion, 85; against, 81; majority for the motion, 4. It was therefore ordered that it should be an instruction to the committee on the Bill to delete Part VI. (Milk-supply).

MONDAY, APRIL 11TH.

Mortality in a Mining Centre.

Mr. STEEL-MAITLAND asked the Secretary of State for the Home Department how many deaths from pneumonoconiosis, bronchitis, and other lung diseases respectively, had occurred in each of the years 1907, 1908, and 1909 in those enumeration districts in the valley of the Don above Sheffield in which ganister mines were situated; what rates those deaths formed of the population of those districts, and how they compared with the rates of mortality from similar diseases for England as a whole; and what would be the mortality figure for those districts from those diseases if calculated on the lines of Table IV., Vol. II., of the last Decennial Supplement to the Report of the Registrar-General.—Mr. CHURCHILL answered: I have communicated with the Registrar-General, who states that causes of death are not classified for areas less than the registration districts, and that while it would be possible to furnish death-rates for the diseases mentioned in the district principally affected during 1907 and 1908, the effect of any special mortality amongst miners would be masked by the general mortality of the district, and that the rates themselves could not be taken as reliable in view of the time that has elapsed since the last census. This would also prevent any mortality figure being prepared. I think the best course will be to leave the matter to the Royal Commission on Mines which will be making inquiry into the working of the special rules for rock-drilling, and will doubtless consider what statistics can be obtained. I may add that the inspector informs me that there is far less dust and ventilation is much better now in these mines, and that workers and officials are agreed that the effect of the special rules has been most beneficial.

Mediterranean Fever.

Mr. ROBERTSON asked the Under Secretary of State for the Colonies whether the Government was about to send another Commission to Malta to investigate further the question of Mediterranean fever; and, if so, what was to be the composition of such Commission; and whether, in view of the fact that the conclusions of the last Mediterranean Fever Commission had been gravely called in question, steps would be taken to ensure that one or more unprejudiced persons would be included in the new Commission, who would be competent and willing to take into serious consideration the sanitary conditions of the island and of the quarters provided for the garrison, and their bearing upon the question of Maltese fevers.—Colonel SEELY said in reply: The question of appointing another Commission to inquire into Mediterranean fever is under consideration; but the only question which appears to require further investigation is the manner in which goats, which have been shown to be the main, if not the only, source of the disease in man, become themselves infected. It will not, therefore, in the opinion of the Secretary of State, be either necessary or desirable to include within the scope of the Commission the matters referred to by my honourable friend.

TUESDAY, APRIL 12TH.

Experiments on Living Animals.

Sir FRANCIS CHANNING asked the Secretary of State for the Home Department whether he would state when the returns of experiments on living animals for 1909 would be issued, and whether he would expedite them.—Mr. CHURCHILL wrote in reply: The returns will, I trust, be issued in June as usual. I am sorry that I do not see my way to expedite the matter.

Appointments.

Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

BOYLAN, D., M.B., B.S. R.U.I., has been appointed Certifying Surgeon under the Factory and Workshop Act for the Ballycastle District of the county of Antrim.

BRAITHWAITE, L. R., F.R.C.S. Eng., has been appointed Assistant Surgeon to the Leeds General Infirmary.

COUPLAND, J. A., F.R.C.S. Eng., has been appointed Assistant Surgeon to the General Infirmary, Leeds.

HALE, R. E. V., M.R.C.S., L.R.C.P. Lond., has been appointed Anæsthetist to the Samaritan Free Hospital for Women.

HANDFIELD-JONES, R., M.D. Durh., M.R.C.S., L.R.C.P. Lond., L.S.A., has been appointed Honorary Physician to the Warneford, Leamington, and South Warwickshire Hospital.

HAYES, G. CONSTABLE, F.R.C.S. Eng., has been appointed Surgeon with charge of the Ophthalmic Out-patients at the General Infirmary, Leeds.

NEWHAM, H. BASIL, M.R.C.S., L.R.C.P. Lond., D.P.H. Camb., D.T.M. & H. Camb., has been appointed Director of the London School of Tropical Medicine.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

BANBURY, HORTON INFIRMARY.—House Surgeon. Salary £80 per annum, with board and residence.

BARNSLEY, BECKETT HOSPITAL.—Junior House Surgeon. Salary £80 per annum, with board, residence, and laundry.

BELGRAVE HOSPITAL FOR CHILDREN, Clapham-road, S.W.—Assistant Surgeon.

BOLINGBROKE HOSPITAL, Wandsworth Common, S.W.—Two House Surgeons for six months. Salary at rate of £75 per annum, with board and residence.

BRISTOL ROYAL HOSPITAL FOR SICK CHILDREN AND WOMEN.—Senior Resident Officer. Salary £100 per annum, with rooms and attendance.

BURY INFIRMARY.—Senior House Surgeon and Junior House Surgeon. Salary £110 and £80 per annum respectively, with board, residence, and laundry.

CANTERBURY, KENT AND CANTERBURY HOSPITAL.—House Surgeon, unmarried. Salary £80 per annum, with board, lodging, and washing.

CARDIFF, UNIVERSITY COLLEGE OF SOUTH WALES AND MONMOUTHSHIRE.—Lecturer in Histology and Embryology. Salary £200 per annum. Also Professor of Pathology and Bacteriology. Salary £450 per annum.

CENTRAL LONDON THROAT AND EAR HOSPITAL, Gray's Inn-road, W.C.—House Surgeon. Salary 40 guineas per annum.

CHELSEA HOSPITAL FOR WOMEN, Fulham-road, S.W.—Clinical Assistant.

CITY OF LONDON HOSPITAL FOR DISEASES OF THE CHEST, Victoria Park, E.—House Physician for six months. Salary at rate of £75 per annum, with board, washing, and residence. Also Clinical Assistant.

CROYDON GENERAL HOSPITAL.—Junior House Surgeon. Salary £60, with board, laundry, and residence.

DEVONPORT, ROYAL ALBERT HOSPITAL.—Assistant Resident Medical Officer, unmarried, for six months. Salary at rate of £50 a year, with board, apartments, and laundry.

DOUGLAS, NOBLE'S ISLE OF MAN GENERAL HOSPITAL AND DISPENSARY.—Resident House Surgeon, unmarried. Salary £90 per annum, with board and washing.

EASTERN DISPENSARY, Leman-street, E.—Resident Medical Officer. Salary £120 per annum, with residence and attendance.

ELHAM UNION.—Medical Officer. Salary £25 per annum, with vaccination fees about £35.

EVELINA HOSPITAL FOR SICK CHILDREN, Southwark Bridge-road, London, S.E.—House Surgeon for six months. Salary at rate of £60 per annum, with board, residence, and washing. Also Honorary Dental Surgeon.

FARNINGHAM AND SWANLEY, KENT, HOMES FOR LITTLE BOYS.—Medical Officer, unmarried. Salary £100 per annum, with board, residence, and laundry.

HEMEL HEMPSTEAD, WEST HERTS HOSPITAL.—House Surgeon. Salary £100 per annum, with rooms, board, and washing.

HEREFORD COUNTY AND CITY ASYLUM, Burghill, Hereford.—Junior Assistant Medical Officer, unmarried. Salary £120 per annum, with board, apartments, and laundry.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—House Physician for six months. Salary 30 guineas.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.—House Surgeon, unmarried, for six months. Salary £30, with board and residence. Also Casualty Medical Officer. Salary £200 per annum, with lunch.

HULL, ROYAL INFIRMARY.—House Physician, unmarried. Salary £100 per annum, with board and apartments.

JOHANNESBURG, TRANSVAAL, GOVERNMENT LABORATORIES.—Assistant Bacteriologist. Salary at rate of £450 per annum.

LEEDS GENERAL INFIRMARY.—Clinical Pathologist. Salary £300 per annum.

LEICESTER INFIRMARY.—House Physician. Salary at rate of £100 per annum, with board, apartments, and washing.

LEICESTER PARISH POOR-LAW INFIRMARY.—Second Resident Assistant Medical Officer. Salary £120 per annum, with rations, apartments, and washing.

LONDON LOCK HOSPITAL AND HOME, Harrow-road, W., and 91, Dean-street, W.—Surgeon.

MANCHESTER ROYAL INFIRMARY AND DISPENSARY.—Honorary Assistant Surgeon.

MIDDLESBROUGH, NORTH RIDING INFIRMARY.—Assistant House Surgeon. Salary £75 per annum, with residence, board, and washing.

MOUNT VERNON HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Hampstead and Northwood, Middlesex.—House Physician. Salary £75 per annum, with board and residence.

NATIONAL DENTAL HOSPITAL AND COLLEGE, Great Portland-street, W.—Assistant Dental Surgeon.

NEWCASTLE-ON-TYNE DISPENSARY.—Visiting Medical Assistant. Salary £160 per annum.

NORWICH, NORFOLK AND NORWICH HOSPITAL.—Assistant House Surgeon for six months. Salary £20, with board, lodging, and washing.

OLDHAM GENERAL INFIRMARY.—Senior House Surgeon. Salary £120 per annum. Also Second House Surgeon. Salary £100 per annum. Also Third House Surgeon. Salary £80 per annum. All for six months, with residence, board, and laundry.

PADDINGTON GREEN CHILDREN'S HOSPITAL, London, W.—House Physician and House Surgeon for six months. Salary at rate of 50 guineas per annum each, with board and residence.

PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham, N.—House Surgeon, House Physician, Junior House Surgeon, and Junior House Physician. Salaries of two former £75 per annum, and of two latter £40 per annum, with residence, board, and laundry.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.—Assistant Resident Medical Officer for four months. Salary at rate of £50 per annum, with board, residence, and washing.

READING, ROYAL BERKSHIRE HOSPITAL.—House Surgeon. Salary £80 per annum, with board, lodging, and washing. Also Second House Surgeon for six months. Salary £60 per annum, with board, lodging, and washing.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—Examiners under the Conjoint Examining Board in England. Also Examiners in Anatomy and Physiology for the Fellowship.

ROYAL LONDON OPHTHALMIC HOSPITAL, City-road, E.C.—Bacteriologist. Salary at rate of £120 per annum, with lunch.

ROYAL NAVAL MEDICAL SERVICE.—Examination for Fifteen Commissions.

RUTLAND COUNTY COUNCIL.—County Medical Officer of Health and County School Medical Officer. Combined salary £400 per annum.

SHEFFIELD ROYAL HOSPITAL.—Assistant House Physician, unmarried. Salary £50 per annum, with board, lodging, and washing.

SOUTHWARK UNION INFIRMARY, East Dulwich-grove, S.E.—Assistant Medical Officer. Salary £100 per annum, with board, lodging, and washing.

TUNBRIDGE WELLS GENERAL HOSPITAL.—Junior Resident Medical Officer. Salary £80 per annum, with board, residence, &c.

WARRINGTON, LANCASHIRE COUNTY ASYLUM, Winwick.—Locum Tenens Medical Officer, unmarried. Salary 4 guineas per week, with apartments, board, &c.

WESTERN SKIN HOSPITAL, 179, Great Portland-street, W.—Clinical Clerk.

WOLVERHAMPTON AND STAFFORDSHIRE GENERAL HOSPITAL.—House Surgeon. Salary at rate of £80 per annum, with board, rooms, and laundry.

YORK DISPENSARY.—Resident Medical Officer, unmarried. Salary £130 per annum, with board, lodging, and attendance.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies as Certifying Surgeons under the Factory and Workshop Act at Tarbert, in the county of Argyll; at Lisdoonvarna, in the county of Clare; at Limavady, in the county of Londonderry; at Carnmoney, in the county of Antrim; at Witney, in the county of Oxford; at Harris, in the county of Inverness; at Navan, in the county of Meath; at Insch, in the county of Aberdeen; and at Ballindalloch, in the county of Banff.

Births, Marriages, and Deaths.

BIRTHS.

CARVER.—On April 11th, at Higher Terrace, Torquay, the wife of A. E. Carver, M.D., of a daughter.

GLENNY.—On April 7th, at Effingham-road, Bristol, the wife of E. T. Glenny, M.B., B.S., of a daughter.

MARRIAGES.

ARMSTRONG—MACMIN.—On April 7th, at St. Pancras Parish Church, Arthur Keith Armstrong, M.R.C.S., L.R.C.P. Lond., of Monmouth, to Louise Lily, daughter of John Macmin, of Dartmouth Park-road, Highgate.

PARSONS-SMITH—BURNETT.—On April 9th, at St. Peter's Church, South Croydon, Basil Thomas Parsons-Smith, M.D., B.S. Lond., to Marguerite Ida, daughter of Sir David and Lady Burnett.

DEATHS.

GAMAN.—On April 9th, in London, Francis R. S. Gaman, M.R.C.S., L.R.C.P., of Calstor House, Calstor, Lincolnshire, aged 40 years.

PERKS.—On April 4th, Charles Perks, L.R.C.P., M.R.C.S., of Burton-on-Trent, aged 68 years.

N.B.—A fee of 5s. is charged for the Insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

THE CONSUMPTION OF ALCOHOLIC BEVERAGES.

Mr. G. B. Wilson, secretary of the United Kingdom Alliance, recently addressed a letter to the *Times*, estimating the total value of alcoholic beverages consumed in the United Kingdom in the year 1909. The uncertainty connected with the Budget was, of course, a considerable obstacle to the accurate estimation, but making such allowances as seem necessary, Mr. Wilson estimated the amount for 1909 at £155,162,485, as compared with £161,060,482 in 1908. His letter continued:—

"There has, therefore, been a decrease in expenditure of £5,897,997. On spirits the decrease was £4,800,000 with a decrease in consumption of 7,022,775 gallons. On beer the decrease was £1,186,000, with a decrease in consumption of 645,396 barrels. On wines, on the other hand, there has been an increase of £93,000, with an increase in consumption of 103,744 gallons. If there had been no increase in prices, the reduction on the total expenditure would have been £11,147,997. In 1909 the average expenditure per head was £3 8*s.* 11½*d.* and per family of five persons £17 4*s.* 9½*d.*, compared with £3 12*s.* 3½*d.* per head and £18 1*s.* 6½*d.* per family in 1908. These figures are, of course, no real indication of what was spent by the adult population which actually consumed the liquor. It is estimated that this class numbers about 55 per cent. of the total population, so that on this basis the *per capita* expenditure is approximately £6 5*s.* per person. Three special causes have been in operation during 1909 to reduce the consumption of alcoholic liquors. Two of them are indicated in the Parliamentary Paper issued last year in anticipation of the Budget: 'The diminishing consumption of alcoholic liquors, though to some extent attributable to the recent depression in trade, is principally the result of a continuous change in the habits of the people, which has been in progress for some time and seems likely to be permanent.' The third is the increased price of spirits, which has been the chief factor in causing the enormous reduction of over 7,000,000 gallons in the quantity of spirits consumed. The national expenditure on alcoholic liquors, notwithstanding its marked reduction since the years 1899 and 1900, still represents an appalling waste of the national resources. According to the syllabus of the Board of Education on Temperance and Hygiene, about two-thirds of the total drink bill, or nearly £2,000,000 a week, is spent by the working classes. If they are above the poverty line this wasted expenditure tends to bring them under it; if they are under it, the waste aggravates their difficulties. Drink-caused poverty is the worst kind of poverty, because it does not make the best of the available resources, and is invariably associated with moral and physical degradation. The burden of the drink evil falls heavily upon the woman; it crushes the child."

It is interesting to see that Mr. Wilson estimates the additional spirit duty paid within the year at £3,000,000, and that the drink trade gained a sum of half that amount.

THE NEW EXAMINATION HALL OF THE ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.

To the Editor of THE LANCET.

SIR,—The last sentence in the description of these buildings which you published last week is a little mysterious. The description says that the figures in the frieze will carry symbolic instruments. What instruments are symbolic of examinations? I can only think of the plough.

I am, Sir, yours faithfully,

TRIFFLER.

HEALTH AND SANITATION IN NORTHERN NIGERIA.

THE report for 1908–09, just presented by the Colonial Office to both Houses of Parliament, states, *inter alia*, that the average number of Europeans resident in the Protectorate during the year, exclusive of those engaged on the northern extension of the Lagos Railway, was 499, of whom 399 were officials and 100 non-officials—481 males and 18 females. The estimated native population of the Protectorate is 7,164,751—an average of 28·02 to the square mile. There were ten deaths from all causes among the Europeans during the year, all being officials; six deaths which occurred on the northern extension of the Lagos Railway are not included. 43 Europeans were invalided home—28 officials and 20 non-officials; there were five deaths amongst officials on leave. The general character of the diseases prevailing showed little or no change. The case mortality of blackwater fever was above the average of the last five years, but the cases were fewer in number, the actual number of admissions being 14 with four

deaths. The greatest amount of sickness among Europeans was due, as in former years, to malaria. The total number of admissions from this disease (blackwater fever being classified separately) was 307, compared with 318 the previous year, 370 in 1906, 445 in 1905, and 515 in 1904—a progressive diminution in the number of cases, notwithstanding the increase of the European population. The native death-rate, so far as ascertainable, varied but little throughout the year, and owing to the absence of any serious epidemic was much lower than in any year since the Protectorate was established. The average number of Europeans employed on the railway was 120, among whom there were two deaths during the year and nine invalidings—a very satisfactory record considering the high rate of mortality on other railway construction work in West Africa. A native hospital has been erected at Baro and a European sick rest-house, which will be replaced this year by a European hospital on the summit of a hill. Three cases of sleeping sickness were admitted to hospital during the year—all natives. There is considerable evidence to show that this disease is not uncommon on the Benue, but the portion of the Protectorate where it is said to occur has not yet been thoroughly examined. It is apparently confined to small areas and has never assumed the form of epidemics such as have occurred in East Africa. The highest shade temperature recorded during the year was 119° F. at Maifoni in March, and the lowest 46° at Geidam in January. The highest mean temperature was 84° at Baro, and the lowest 75° at Zaria. More rain fell in Bassa than in any other province, the rainfall there totalling 58·77 inches. The largest amount (5 inches) recorded for one day fell at Ilorin in October. The rainfall at Zungeru was 48·78 inches; Lokoja, 44·12; Ilorin, 55·46; Maifoni, 23·3; Bauchi, 47·88; Kano, 34·86; and Sokoto, 20·44 inches.

WEAK MILK AT HASTINGS WORKHOUSE.

IN whatever light Mr. Harold Goodwin regards the inmates of Hastings workhouse there is no justification for his supplying the institution with added water in the milk when the guardians have already seen that a sufficient supply of water is procurable at the call of the officials. On the delivery of the milk on Feb. 15th samples were taken and it was found that the milk contained 2·5 per cent. of fat, 8 per cent. of solids not fat, and 89·5 per cent. of water. These percentages were equivalent to an addition of 10 per cent. of water to milk containing fat 2·8 per cent., solids not fat 8·9 per cent., and water 88·3 per cent. Inasmuch as Goodwin was the milk contractor and as last year he supplied no fewer than 14,350 gallons of the lacteal fluid to the workhouse the magistrates did not err on the side of severity when they imposed a fine of £10 and costs.

WESTON AND HIS WALKS.

IN THE LANCET of 1876 and 1877 we published some remarks concerning the American pedestrian, Edward Payson Weston, and later on some papers by Dr. F. W. Pavy on observations connected with his metabolism. Mr. Weston is now nearly 72 years of age, but he is engaged upon a great transcontinental walk "from ocean to ocean in 90 days." He departed from the City Hall, Los Angeles, California, on Feb. 1st last, and expects to reach the City Hall, New York, on May 17th, a distance of 3483 miles from the starting point. The scheduled time of 90 days does not include Sundays, when he rests. He claims that during the past 42 years he has walked in public a distance thrice the circumference of the earth. In 1876 he walked at the Agricultural Hall, Islington, a total of 1015 miles within a period of five consecutive weeks, before 200,000 people. In the same year he also walked at Edinburgh and Liverpool. In 1877 he walked at Edinburgh, Bradford, Bristol, Newcastle-on-Tyne, and Hull. In 1878 he walked at Newcastle-on-Tyne, Glasgow, and Bradford. In 1879 at the Agricultural Hall, London, he won the "Astley Belt" by covering a distance of 550 miles in 141 hours and 44 minutes. From Nov. 21st, 1883, to March 15th, 1884, under the auspices of the Church of England Temperance Society, Mr. Weston walked a distance of 50 miles per day for 100 days, without walking on Sundays, making a distance of 5000 miles. At the close of each day's walk he delivered a brief lecture on the subject of temperance. It will be interesting to see whether Mr. Weston will accomplish his ambitious task now that he is a septuagenarian.

A. B. C.—The question of branch surgeries is a very difficult one. Where they are instituted for the good of the public, both with a view to save the public time and assist the general practitioner in his routine of work, they are of course legitimate. Where a man puts up a plate in the heart of other men's practices he must expect some criticism. It is quite impossible to lay down any definite rule as to what is legitimate rivalry and what is over-sharp competition. Every practitioner in these matters must be a law to himself. The correspondent who asked us questions on this matter also desired to know the position with regard to medical men canvassing for club appointments. The General Medical Council has expressed a strong opinion with regard to all canvassing, whether by the medical man personally or by an agent in his behalf, and any medical man who wilfully offends in this direction runs a risk of being removed from the Medical Register.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 20, Hanover-square, W.

WEDNESDAY.

BALNEOLOGICAL AND CLIMATOLOGICAL SECTION (Hon. Secretaries—Septimus Sunderland, F. A. de T. Mouillot) at 15, Cavendish-square, W.: at 5.30 P.M.

Adjourned Discussion:
On Arthritis Deformans (to be re-opened by Dr. A. E. Garrod).

Paper:
Dr. Leigh Canney (Assouan): The Climate of Egypt and North Africa in Relation to the Treatment of Disease.

THURSDAY.

DERMATOLOGICAL SECTION (Hon. Secretaries—E. G. Graham Little, H. G. Adamson) at 11, Chandos-street, W.: at 5 P.M.

Cases:
Mr. J. E. R. MacDonagh: (1) Dermatitis Herpetiformis; (2) Some Cases of Syphilis illustrating the Importance of Wassermann's Reaction.
And other Cases.

FRIDAY.

SECTION FOR THE STUDY OF DISEASE IN CHILDREN (Hon. Secretaries—E. I. Spriggs, J. P. Lockhart Mummery, J. T. Leon) at 11, Chandos-street, W.: at 4.30 P.M.

Cases:
Dr. F. Langmead: Case of Congenital Scoliosis due to Spinal Malformation.
Dr. L. G. Parsons: Case of Congenital Acholuric Jaundice.
And other cases.

Papers:
Dr. F. Langmead: A Short Paper on 80 Consecutive Cases of Wasting Infants Fed on Undiluted Citrated Milk.

EPIDEMIOLOGICAL SECTION (Hon. Secretaries—W. H. Hamer, G. S. Buchanan) at 15, Cavendish-square, W.: at 8.30 P.M.

Paper:
Dr. Sheridan Delépine: Contribution to the Study of the Influences Determining the Prevalence of Bovine Tuberculous Mastitis.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

MEDICAL GRADUATES' COLLEGE AND POLYCLINIC, 22, Chenies-street, W.C.

MONDAY.—4 P.M., Dr. S. E. Dore: Clinique (Skin). 5.15 P.M., Lecture:—Dr. C. O. Hawthorne: Mind Blindness.

TUESDAY.—4 P.M., Dr. G. A. Sutherland: Clinique (Medical). 5.15 P.M., Lecture:—Dr. S. Spicer: The Modern Treatment of Hay Fever.

WEDNESDAY.—4 P.M., Mr. A. Edmunds: Clinique (Surgical). 5.15 P.M., Lecture:—Dr. W. H. B. Stoddart: Neurasthenia and Psychasthenia.

THURSDAY.—4 P.M., Dr. H. Campbell: Clinique (Medical). 5.15 P.M., Lecture:—Mr. R. Lake: The Diagnosis and Indications for Operation in Suppurative Disease of the Labyrinth.

FRIDAY.—4 P.M., Mr. H. L. Eason: Clinique (Eye).

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—2.30 P.M., Dr. Saunders: Demonstration of Cases (Medical Wards).

THURSDAY.—4 P.M., Mr. Baldwin: Demonstration of Cases (Surgical Wards).

FRIDAY.—3 P.M., Dr. S. Taylor: Demonstration of Cases (Medical Wards).

LONDON SCHOOL OF CLINICAL MEDICINE, Dreadnought Hospital, Greenwich.

MONDAY.—2 P.M., Operations. 2.15 P.M., Mr. Turner: Surgery. 3.15 P.M., Sir Dyce Duckworth: Medicine. 4 P.M., Mr. R. Lake: Ear and Throat. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Ear and Throat. 3.15 P.M., Special Lecture:—Sir Dyce Duckworth: The Treatment of Cardiac Dilation.

TUESDAY.—2 P.M., Operations. 2.15 P.M., Dr. R. Wells: Medicine. 3.15 P.M., Mr. R. Carling: Surgery. 4 P.M., Sir M. Morris: Diseases of the Skin. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Skin.

WEDNESDAY.—2 P.M., Operations. 2.15 P.M., Dr. F. Taylor: Medicine. 3.30 P.M., Mr. Cargill: Ophthalmology. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 11 A.M., Eye.

THURSDAY.—2 P.M., Operations. 2.15 P.M., Dr. G. Rankin: Medicine. 3.15 P.M., Sir W. Bennett: Surgery. 4 P.M., Dr. Sale-Barker: Radiography. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Ear and Throat. 3.15 P.M., Special Lecture:—Sir William Bennett: Treatment of Tuberculous Glands.

FRIDAY.—2 P.M., Operations. 2.15 P.M., Dr. R. Bradford: Medicine. 3.15 P.M., Mr. McGavin: Surgery. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 12 noon, Skin.

SATURDAY.—2 P.M., Operations. Out-patient Demonstrations:—10 A.M., Surgical and Medical. 11 A.M., Eye.

CENTRAL LONDON THROAT AND EAR HOSPITAL, Gray's Inn-road, W.C.

TUESDAY.—3.45 P.M., Lecture:—Mr. W. Stuart-Low: Accessory Sinuses.
FRIDAY.—3.45 P.M., Lecture:—Mr. W. Stuart-Low: Accessory Sinuses.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton, S.W.

WEDNESDAY.—4 P.M., Lecture:—Dr. C. Wall: Intra-thoracic Growths.

ROYAL INSTITUTION OF GREAT BRITAIN, Albemarle-street, Piccadilly, W.

TUESDAY.—3 P.M., Mr. A. Harden: The Modern Development of the Problem of Alcoholic Fermentation. (Lecture III.)
FRIDAY.—9 P.M., Mr. T. T. Baker: The Telegraphy of Photographs, Wireless and by Wire.

OPERATIONS.

METROPOLITAN HOSPITALS.

MONDAY (18th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (2 P.M.), St. Mary's (2.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), Chelsea (2 P.M.), Samaritan (Gynæcological, by Physicians, 2 P.M.), Soho-square (2 P.M.), City Orthopædic (4 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (9.30 A.M.), Royal Free (2 P.M.), Guy's (1.30 P.M.), Children, Gt. Ormond-street (9 A.M.), St. Mark's (2.30 P.M.), Central London Throat and Ear (Minor 9 A.M., Major 2 P.M.),

TUESDAY (19th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College (2 P.M.), St. George's (1 P.M.), St. Mary's (1 P.M.), St. Mark's (2.30 P.M.), Cancer (2 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Soho-square (2 P.M.), Chelsea (2 P.M.), Children, Gt. Ormond-street (9 A.M. and 2 P.M., Ophthalmic, 2 P.M.), Tottenham (2.30 P.M.), Central London Throat and Ear (Minor, 9 A.M., Major, 2 P.M.).

WEDNESDAY (20th).—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing Cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), King's College (2 P.M.), St. George's (Ophthalmic, 1 P.M.), St. Mary's (2 P.M.), National Orthopædic (10 A.M.), St. Peter's (2 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Gt. Northern Central (2.30 P.M.), Westminster (2 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Cancer (2 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Royal Ear (2 P.M.), Royal Orthopædic (3 P.M.), Children, Gt. Ormond-street (9 A.M. and 9.30 A.M., Dental, 2 P.M.), Tottenham (Ophthalmic, 2.30 P.M.), West London (2.30 P.M.), Central London Throat and Ear (Minor, 9 A.M., Major, 2 P.M.).

THURSDAY (21st).—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), University College (2 P.M.), Charing Cross (3 P.M.), St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex (1.30 P.M.), St. Mary's (2.30 P.M.), Soho-square (2 P.M.), North-West London (2 P.M.), Gt. Northern Central (Gynæcological, 2.30 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Royal Orthopædic (9 A.M.), Royal Ear (2 P.M.), Children, Gt. Ormond-street (9 A.M. and 2 P.M.), Tottenham (Gynæcological, 2.30 P.M.), West London (2.30 P.M.), Central London Throat and Ear (Minor, 9 A.M., Major, 2 P.M.).

FRIDAY (22nd).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Charing Cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.), St. Mary's (2 P.M.), Ophthalmic (10 A.M.), Cancer (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), City Orthopædic (2.30 P.M.), Soho-square (2 P.M.), Children, Gt. Ormond-street (9 A.M., Aural, 2 P.M.), Tottenham (2.30 P.M.), St. Peter's (2 P.M.), Central London Throat and Ear (Minor, 9 A.M., Major, 2 P.M.).

SATURDAY (23rd).—Royal Free (9 A.M.), London (2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), University College (9.15 A.M.), Charing Cross (2 P.M.), St. George's (1 P.M.), St. Mary's (10 A.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Children, Gt. Ormond-street (9 A.M. and 9.30 A.M.), West London (2.30 P.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic Hospitals operations are performed daily.

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Lectures, original articles, and reports should be written on one side of the paper only, AND WHEN ACCOMPANIED BY BLOCKS IT IS REQUESTED THAT THE NAME OF THE AUTHOR, AND IF POSSIBLE OF THE ARTICLE, SHOULD BE WRITTEN ON THE BLOCKS TO FACILITATE IDENTIFICATION.

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METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, April 13th, 1910.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
April 7	29·97	E.	...	59	49	43	42	43	Raining
,, 8	30·07	N.E.	...	69	51	38	40	42	Overcast
,, 9	30·05	N.E.	...	90	56	39	41	44	Fine
,, 10	30·02	W.	...	53	49	42	42	45	Raining
,, 11	29·94	S.W.	...	100	58	43	45	48	Fine
,, 12	29·53	S.	...	97	61	48	48	50	Raining
,, 13	29·20	S.W.	0·03	73	56	50	51	53	Overcast

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